ORIGINS

The Journal of The Biblical Creation Society

No.31

July
2001

Fable of the
Flat Earth

Non-
Aggression
Claws

BCS Strategy
Weekend

Hi-Tech Trilobites

Darwin and the Tree of Life

Noah's Ark in Somerset

£3.00

ORIGINS
• Journal of the Biblical Creation Society •

No. 31 July 2001

The Noah's Ark Farm

The Noah's Ark Farm Centre in Somerset is not only a great place for a day out but it is also a tremendous witness to the truth of the Bible. In a highly original way, it presents the historical and scientific evidence that supports Genesis. Paul Garner recently visited the farm to meet Anthony and Christina Bush, the couple behind this inspirational outreach. 2

BCS National Strategy Weekend

Our photo feature highlights the weekend in November 2000 when the *BCS* committee and other supporters met for prayer and discussion about the future direction of the Society. 5

Claws, Jaws and the Fall

According to the Bible, God created a paradise in which there was no bloodshed or suffering. However, some animals look as though they were designed to be killing machines. Before sin entered the world, what did animals use their 'attack and defence' structures for? Paul Garner takes a look at the cat family and suggests some answers. 6

Trilobites: the 'Beetles' of the Palaeozoic

Trilobites are among the 'oldest' multi-celled animals in the fossil record, but there was nothing primitive about them. They were a triumph of design and complexity, every bit as advanced as modern-day creatures. In this fascinating article, Paul Garner explores the vanished world of these amazing arthropods. You've seen 'Walking With Dinosaurs', now come 'Scuttling With Trilobites'! 9

The Scandalous 'Flat Earth' Myth

There is a widespread belief that Christopher Columbus 'proved' the earth was round—to the astonishment of his contemporaries who thought that it was flat and that he might sail off the edge. But did medieval scholars really think the world was flat? Does the Bible teach a 'flat earth'? Dr. David Tyler looks at Jeffrey Burton Russell's book *Inventing the Flat Earth* and reveals the facts behind the myth. 15

The Ambitions, Beliefs and Concepts of Charles Darwin

Charles Darwin set in motion a revolution that has had pernicious effects throughout society and in every field of human thought. In the second and final instalment of his article, Dr. Leonard Loose provides further fascinating insights into the formative influences on the young naturalist. 17

Reviews

Dr. David Tyler tackles the feuding factions in *The Darwin Wars* and considers Christian involvement in academia in *The Wedge of Truth*. Dr. Pete Williams delves into *The Piltdown Mystery*. 21

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COVER PICTURE

Trilobites in the collection of Paul Garner. Clockwise from top left: *Calymene*, *Scutellum*, *Calymene* (enrolled specimen), *Phacops* (enrolled specimen).

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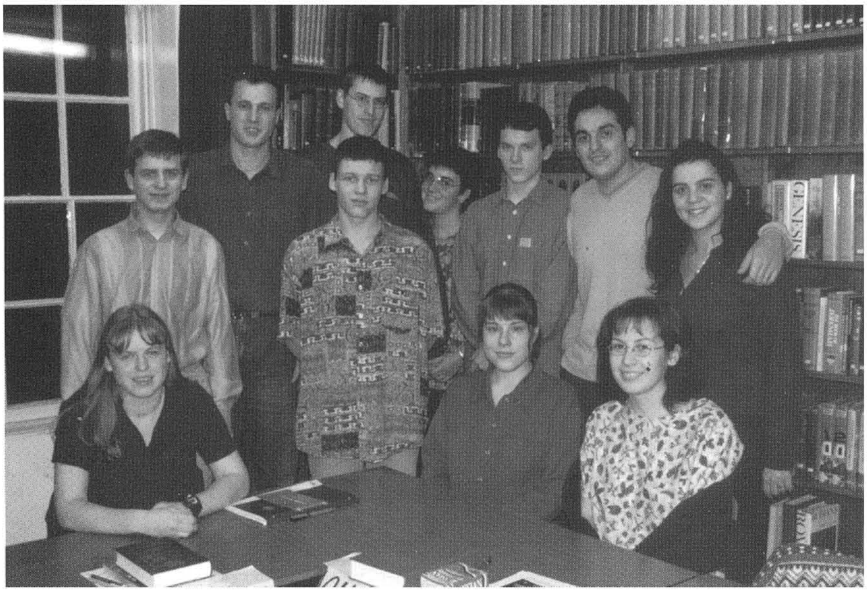
Editorial

A Gospel Work

IN NOVEMBER 2000, I was delighted to present the biblical creation message to students at the European Missionary Fellowship's School of Evangelism. This is the third occasion I have been invited to address students at the EMF. Here were young people from eight countries, all with a desire to serve the Lord and proclaim the gospel. What an opportunity to help lay a good foundation for evangelistic witness!

The first session focused on biblical matters. It was thrilling to share with them the vital importance of a correct understanding of Genesis to the rest of Scripture and why it is foundational to the gospel. I was able to explain to them Paul's method of evangelism to the Greeks on Mars Hill (Acts 17) and its relevance to us today in witnessing to a pagan culture. We were able to review the problems with the various accommodationist positions, such as theistic evolution, the gap theory, and progressive creation. In the second session, we turned to the scientific evidence and critically examined the popular textbook arguments in favour of large-scale Darwinian change. We touched upon the role of natural selection and mutation, similarities in form and chemistry, embryological development, vestigial organs, and transitional forms in the fossil record. Finally, we looked at the age of the earth, covering the assumptions behind radioisotope dating methods, the evidence for catastrophism in the rock record, and arguments for a young earth. We covered a great deal of ground. Please pray for these young people—that they will be bold witnesses, equipped with the answers they need.



Students from eight countries at the European Missionary Fellowship: Hungary, Moldova, Estonia, Ukraine, Czech Republic. Spain, Italy and Russia

As I addressed these young people, with all the potential that they have to influence the world for Jesus Christ, I was reminded yet again that the work of the *Biblical Creation Society* is a gospel ministry. It is not about arcane matters of science—though there is a need for technical research and solid answers. It is not about entertaining Christians—though we hope that our lectures and presentations are exciting and challenging. At heart it is a *gospel* ministry. We are serving the Lord in *BCS* because we want to see the church built up in the faith, confidence in the Bible restored, and men and women saved. Please consider how you might become a partner with us in the work—perhaps by arranging a meeting, sharing our literature with others, or supporting us financially or in prayer. And remember to praise God for the many encouragements and let us know how the Lord is using the work of *BCS*.

Finally ...

Congratulations are due to Dr. Stuart Burgess of the University of Bristol, who we interviewed in our last issue. Since that issue went to print, Stuart has received a 'double promotion' from Lecturer to Reader in Engineering Design (bypassing Senior Lecturer). We are delighted at this news, especially in view of Stuart's clear and courageous stand for the truth of Genesis in his book, *Hallmarks of Design*. Eagle-eyed readers of our contents page will have spotted that our Vice-President, David Watts, has also been promoted. David is now Professor of Dental Biomaterials Science and Head of Unit at the University of Manchester Dental School. We are sure that all our readers will be one with us in sending Stuart and David our best wishes.

Stop press!

BCS is delighted to announce that Professor David B. Gower has accepted our invitation to become a Vice-President of the Society. David is Emeritus Professor of Steroid Biochemistry at the University of London. He holds a BSc in Chemistry, a PhD in Biochemistry, and was awarded a DSc for his research into the biochemical mechanisms for the control of steroid hormone formation. He has published on this subject for *BCS* (*Biblical Creation* 1984;6(17):149-59). Professor Gower is a Fellow of the Royal Society of Chemistry, a Fellow of the Institute of Biology and a Chartered Chemist.

Paul Garner

The Noah's Ark Farm:
An Interview with Anthony Bush

YOU DO NOT expect to discover Noah's Ark deep in the North Somerset countryside, but if you visit Moat House Farm in Wraxall that is just what you find! The Noah's Ark Farm Centre is a wonderful place. It has over 100 animals, representing 40 different breeds or species. There are adventure playgrounds, a food and farming exhibition, tractor rides, and, on fine days, stunning views across the Severn Estuary into Wales. There is also a nature and archæology trail.

However, the centrepiece of the farm is undoubtedly the Noah's Ark exhibition. It is the only one of its kind in the world, with a beautiful 14-foot scale reconstruction of the Ark complete with model animals being loaded on board. There are many supporting features—including panels giving historical and scientific evidence for Creation and the Flood. Anthony and Christina Bush are the inspiration behind this unique outreach. Paul Garner visited the farm recently and afterwards interviewed Anthony about it.

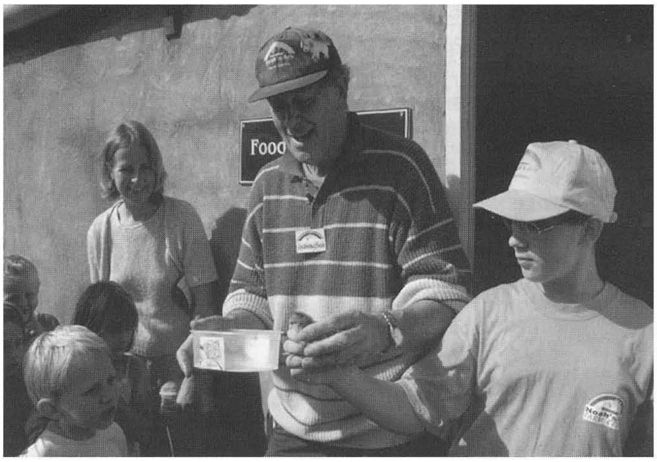
Q: Anthony, how long have you and your family farmed at Wraxall?

I took the tenancy 40 years ago and married Christina, my wife, 39 years ago. We have four children who are all married, and 12 grandchildren. In the 1960s we were like Old MacDonald and kept dairy cows and calves, beef animals, and pigs and hens and turkeys and grew potatoes and cereals. We became more specialised over the years until we were only dairy farmers.

Q: What about your testimony? How did you become a Christian?

My secondary school was a Christian one. I became a Christian at 14 through the influence of a boy in my year and the preaching of a visiting evangelist. I had always believed that God was out there somewhere, but it was then that I discovered what Jesus had done for me personally, and my life with Him began.

The Noah's Ark Heritage Exhibition, a 14-foot long reconstruction of the Ark with models of the animals being loaded on board.



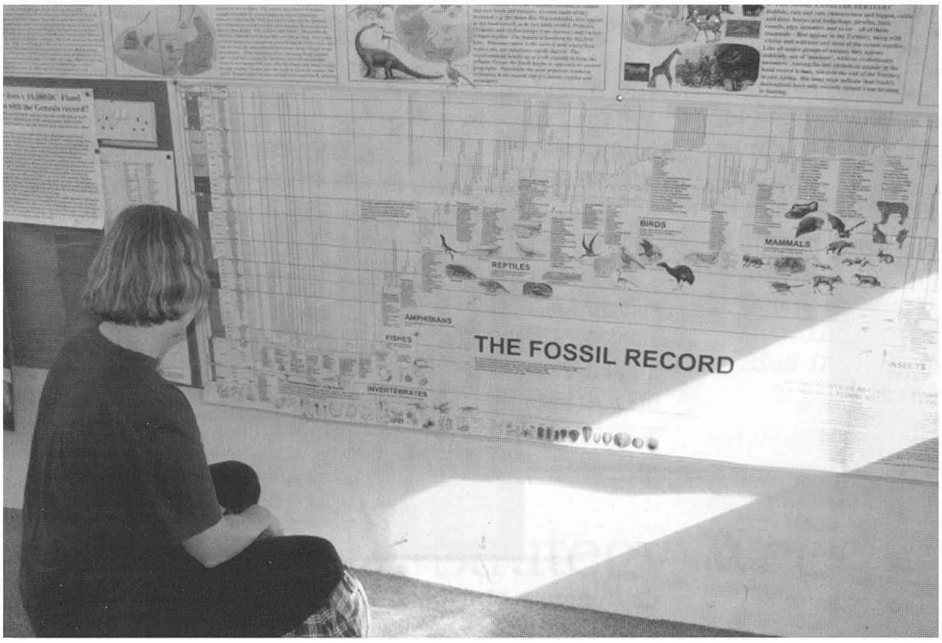
Anthony explaining the development of a chick to a group of fascinated visitors.

Q: Tell us about your involvement with the Send a Cow to Africa scheme.

At Billy Graham's Amsterdam '86 Congress of Evangelists I met a Nigerian pastor who invited me to preach in Nigeria. Whilst there I discovered that there was a tremendous need for modern dairy animals in Africa, but that Nigeria was not the place to begin. I started meeting with a group of Christian dairy farmers from Devon and Somerset to think and pray about how to help Africa. A Ugandan Bishop, and later a Ugandan development worker, came to my farm in 1987 and together we worked out a detailed and technical scheme to take British dairy cows to Uganda. We began in 1988 and the scheme has now spread to five African countries, and we have added other sorts of animals as well. We now operate in Ethiopia, Rwanda, Kenya, Lesotho and Uganda.

Q: As a farmer you have daily contact with the natural world. What has that taught you about the hand of God in creation?

It has always seemed obvious to me that the most important things in farming are out of our control—the weather and disease and the mysterious way that some crops and animals are brilliant and others, despite our best efforts, are not. We have always worked very hard and



There are many supporting features in the exhibition—like this panel giving a creationist perspective on the fossil record.

long hours but always prayed about daily decisions and needs. Although I think God prefers not to intervene in His 'Nature', we have been blessed many times by answered prayer when we have asked Him specifically to intervene. Sometimes I am surprised, like the time when an atheist vet came to the farm to treat a sick cow. After the treatment I told the vet that we would pray for the cow there and then. I took off my hat and prayed. The outcome was that the cow died, but the vet became a Christian!

Q: When did you first become aware of the importance of the biblical creation message?

At school we had some pretty fierce debates about creation and evolution. At that time—the 1950s—evolution was not taken as seriously as it is now and seemed pretty ludicrous to most of the staff. It always has to me.

Q: How did the Lord lead you to develop the Noah's Ark Farm Centre?

For 35 years we were dairy farmers, but had the opportunity to buy the farm from the landlord in 1995, when there was a brief window of opportunity to sell the milk quota at a high enough price to buy the farm. This would not have been possible two years before or since. We felt God had a reason for giving us this opportunity, and that we should start a Christian theme park. Noah has always interested me, with his links with the animals and with God and as a great preacher.

Q: When did the centre open?

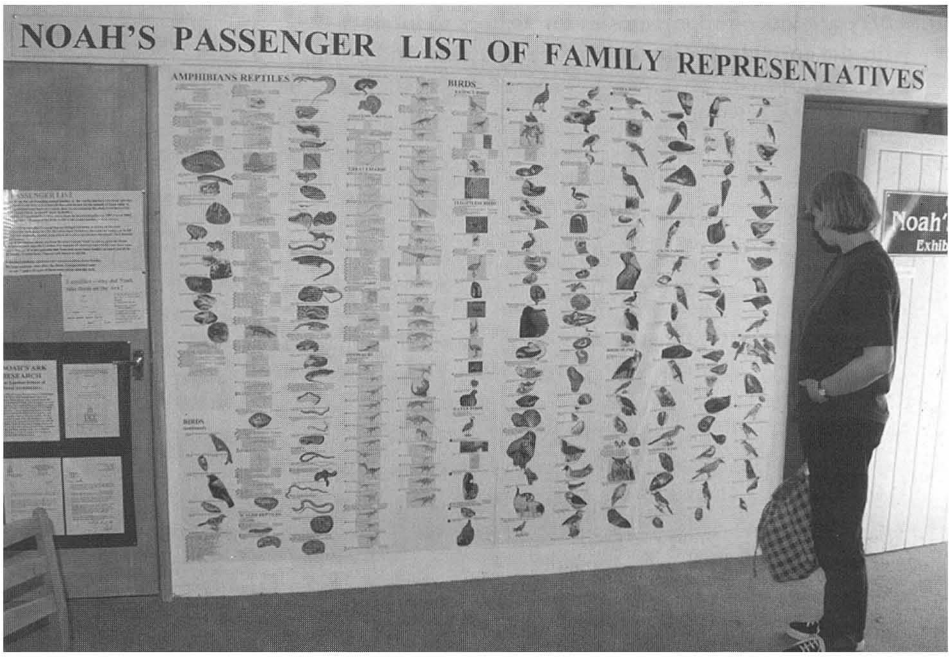
We had a trial period in 1998 when we opened two days per week for ten weeks. Entry was free and we just had the Noah's Ark exhibition, a food and farming exhibition, a small trailer ride, a few animals, a small adventure playground and a café. We realized that we were very deficient in almost everything so have expanded in all areas since then, especially in 'covered' activities. We now charge for entry, but we think, compared to what is on offer elsewhere, it is very good value!

Q: How many visitors have you had since then?

About 58,000. We also have a function room where churches bring Alpha Courses or other groups. We have nativity plays each year, country and gospel concerts and other occasional events. We also have about 50 young volunteer staff, aged 11–16, who we train and to whom we give jobs involving animals and visitor supervision. We also have a small paid staff.

Q: How about school parties?

We have lots of younger children in school parties, and would like older ones. But most schools are not geared up to go on expeditions unless they know it helps them with the National Curriculum. We can help them, but so far only Christian schools of an older age have come. We have some wonderful glowing comments from those who have


NOAH'S PASSENGER LIST OF FAMILY REPRESENTATIVES
AMPHIBIANS REPTILES
BIRDS
Noah'
Exhib

One wall of the exhibition beautifully illustrates the families of reptiles, birds, and mammals that Noah would have taken on board the Ark.

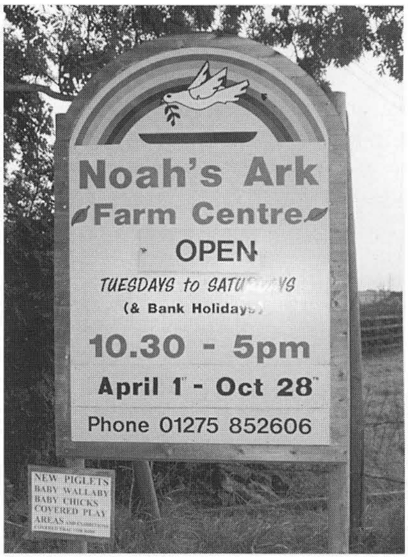
The centre makes a memorable day out for children and there are lots of opportunities to 'meet' the various animals!

come. We also have lots of Sunday School outings, some coming from as far away as Birmingham.

Q: What animals do you have here?
We are just about to receive our Zoo Licence so that we can expand our collection to include bison and camels. We already have llamas, wallabies, rheas, lots of sorts of cattle, sheep and goats, a water buffalo, rabbits, guinea pigs, ferret, gerbils, lots of water birds and game birds, including peacocks, a demonstration bee-hive, and parrots. We have 1,000 ewes lambing in April to show people twice a day.

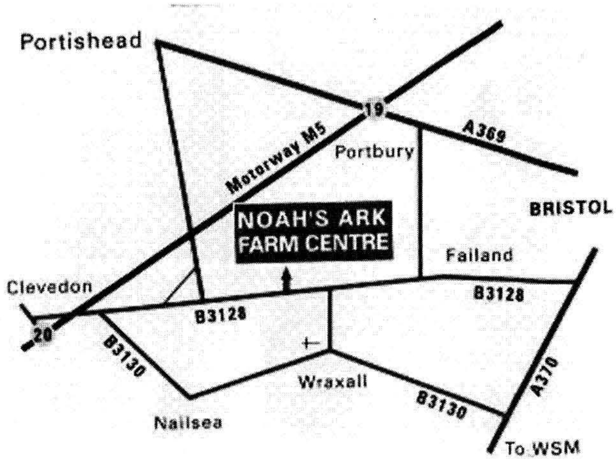
Q: There are lots of opportunities for visitors to interact with the animals, for instance at feeding time and during a 'lamb race'. You obviously felt it was important to make the experience 'hands on'?
There are widespread fears of disease from animals, which I think has been blown out of proportion. We think it very important to let people hold small animals and baby chicks and lead larger ones and see close-to how wonderful and different they have all been made. Hygiene is important too, so everyone washes their hands. We also pray for protection every day for our staff and visitors.

Q: Perhaps the most exciting part of the centre is the Noah's Ark Heritage Exhibition. Could you tell us about that?
This is certainly the theme of the 'theme park' and we have tried hard to keep it up-to-date with creationist thinking around the world. There is sharp disagreement at the moment about whether the Flood came before the whole geological record or whether it created it. We explain both views but major on one. Both these views support a young earth and we include other evidence for that. There is also a play Ark added this year, underneath the main model, so that parents can spend longer while their little children play. The whole exhibition is in a lovely old barn that seems to show it off well.



Q: I was delighted to see how you introduce creation very naturally into your presentations. What reactions do you get to that—and the exhibition—from visitors?
People seem to take it at different levels. Some come for the animals and the play, others like the beautiful surroundings or the farming talks that we give from the tractor and in the animal shows. Others like the mentions we give to God every day and the exhibition. We pray each day that God will bless each visitor as only He can.

Q: Children love the farm as I discovered when I visited with my family in September 2000. As we were leaving, our two children were already asking when we were going to come back! How have you catered for children at the centre?
Children feature very highly, both in the animal handling and the adventure play and in the things we sell in the gift shop and food barn. We gear our talks to children and give them all the time and attention we can. But we also have adult features which probably are unnoticed by the children. We hope all the family and single people will have a good and informative day out here.



Q: Christina leads art classes at the farm too. Tell us about that.

My wife is a professional painter and art teacher. She teaches adults one day a week on the farm in the summer. She also helps youngsters do simple drawing or painting in her studio every day we are open. The studio is also the gift shop where she sells nice but inexpensive gifts and theme-related items, including some Christian books.

Q: What is your desire for the Noah's Ark Farm Centre? What do you hope to achieve?

We hope that thousands of people each year will have a brilliant day out in God's countryside, be reminded that He made it all and loves us, and will go away remembering the fun and the interesting and edifying things they saw and heard. We pray every day that some will come to know Christ and start going to church. Five have in our own church.

The Noah's Ark Farm Centre is open between 10:30 am and 5:00 pm, Tuesdays to Saturdays and Bank Holidays. The centre will be open for the 2001 season from 24th March until 27th October. The address is Moat House Farm, Failand Road, Wraxall, Bristol BS48 1PG. General enquiries: 01275 852606.

BCS National Strategy Weekend

IN NOVEMBER 2000, the *BCS* committee and other friends gathered at Cloverley Hall Christian Conference Centre in Shropshire to discuss and pray about the Society's future strategic direction.

We were able to review the main points that had arisen from the regional meetings with members earlier in the year, and there then followed a 'brainstorming' session at which we identified the issues the group considered central to taking the ministry forward. Five main themes emerged:

(1) the release of full-time workers;
(2) popularising the creation message;
(3) addressing intellectual leaders, church leaders, and students;
(4) the public image of *BCS*;
(5) communication.

We spent a full day discussing these themes and the ways in which the Society might address them with the Lord's help. A summary of our conclusions was circulated to members in our December 2000 mailing. The weekend was a positive and constructive one, and a time of warm fellowship. We covered a great deal of ground and left feeling that real progress had been made. Most importantly, we believe that the Lord was present with us. Please pray that the Lord will continue to bless the Society

Cloverley Hall was the beautiful setting for the BCS National Strategy meeting held over the weekend of 3rd to 5th November 2000.
[Photo: Paul Garner]

Participants in the BCS National Strategy weekend.
From left to right:
Seated: Mike Matthews, Colin Reeves, Sheena Tyler, Liz Reeves, Charles Whitworth, Stephen Catton, Brian Watt;
Standing: David Tyler, Peter Senior, Nancy Darrall, Eoghan Mhor, Neil Brownrigg.
[Photo: Paul Garner]

Claws, Jaws and the Fall

Paul Garner

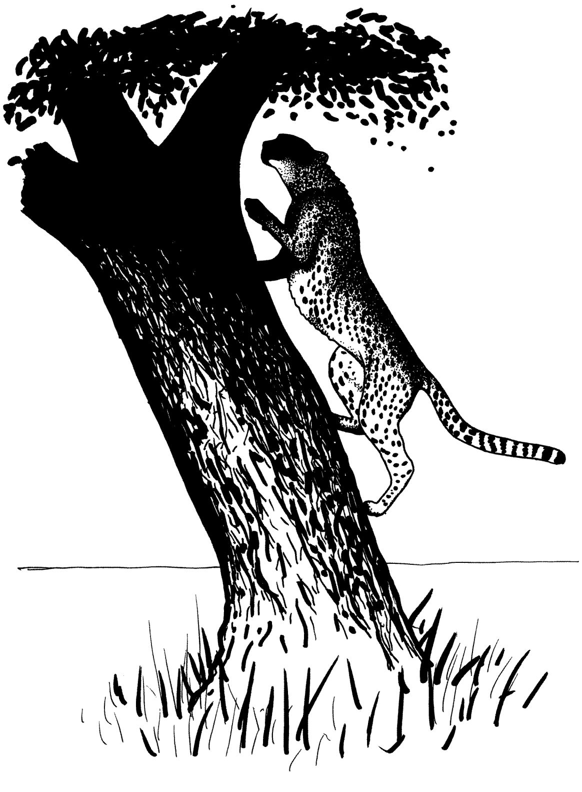
CAREFULLY, silently, the cat stalks its prey. Its ears are flattened, its eyes are riveted unblinkingly ahead. Every muscle is tense as the cat crouches low in the undergrowth. Slowly, inch by inch, it moves closer, freezing whenever its prey shows signs of wariness. Then, in a sudden burst of speed, the cat streaks towards its victim, pounces and delivers the fatal bite!

It is a scene that is acted out every day by the domestic cats in our gardens. It is also familiar to us from wildlife films of big cats on the African plains. It is grimly fascinating, yet somehow it makes us uneasy. As we watch the bird struggling to escape, as we see the twitching legs of the hapless wildebeest, we are discomforted. Nature really is 'red in tooth and claw'. Some critics ask, 'If God is loving and good, why did he make the world like this?'[1] The Bible's answer is straightforward—He didn't! Scripture teaches us that God created a paradise, which He pronounced 'very good' (Genesis 1:31). There was nothing to spoil Adam and Eve's enjoyment of the creation, nothing in it that would cause harm or hurt. Death, suffering and sickness were unknown to them (see inset box 1). People and animals were originally vegetarian (Genesis 1:29-30). However, Genesis 3 tells us the tragic account of Adam and Eve's rebellion against their Maker, and the curse on creation that was the result. Death entered the world for the first time. Likewise, predator-prey relationships in the animal kingdom. The whole creation[2] has been 'groaning' under this bondage to decay ever since (Romans 8:22). The good news is that when the Lord returns, these things will be abolished forever (Revelation 21:4). The creation will be set free and the lion will, once more, eat straw like the ox (Isaiah 11:7, 9; 65:25).

However, this presents us with a problem. In many ways, cats look as if they were made to be 'killing machines'. Take their retractile claws for example. They are a masterpiece of design (see inset box 2), but they seem to be designed to kill! Cats use their claws to control their prey while they deliver a killing bite. Assuming that cats have always had their claws, what were they doing with them in the paradise before the Fall? Likewise, cats have sharp teeth that are good at tearing into flesh. If they were not meat-eating originally, why did God equip cats with such fearsome jaws? Many people, even Christians, find it difficult to accept the Bible's description of a perfect creation. They look at the world around them and see the food chains, the aggressive meat-eaters, the death and suffering, and do not consider the possibility that the world might once have been different. Many have sought to reinterpret Genesis in the light of these observations of the present-day world. However, this is a serious error. Certainly it is difficult for us to conceive what the world was like before the Fall. We live in a cursed world, with fallen minds. However, our inability to conceive of something is not a good reason to reject it if the Bible speaks clearly on the matter. It is difficult to imagine how the Israelites could have walked in the wilderness for forty years without their feet swelling or their clothes wearing

1 'Life' and 'death' according to the Bible

The Bible clearly teaches that physical death came about as a result of man's sin (see the statements in our *Creation Manifesto*). Some Christians have questioned this teaching because, they say, plants must have 'died' before the Fall when Adam and Eve and the animals ate them. However, this argument ignores the Bible's definition of 'life'. The primary Hebrew word that describes 'living' things is *nephesh*. It carries the connotation of 'consciousness' and its focus is on man and the 'higher' animals. It does not refer to plants. Neither does the Hebrew word *basar*, meaning flesh. This word also refers only to man and the animals. A third Hebrew word is *ruach*, which means wind or breath. Again, plants are never said to have this characteristic. Finally, the Old Testament associates 'life' with blood (e.g. Leviticus 17:11), something which plants—and some more 'lowly' animals—do not possess. Thus, plants are not 'alive' in the biblical sense and the eating of plants does not constitute death.



Most cats are good climbers and may have used their claws as 'grappling hooks' before the Fall. This would have allowed them to rest and sleep in trees and to feed on the fruit there.

Figure 1a

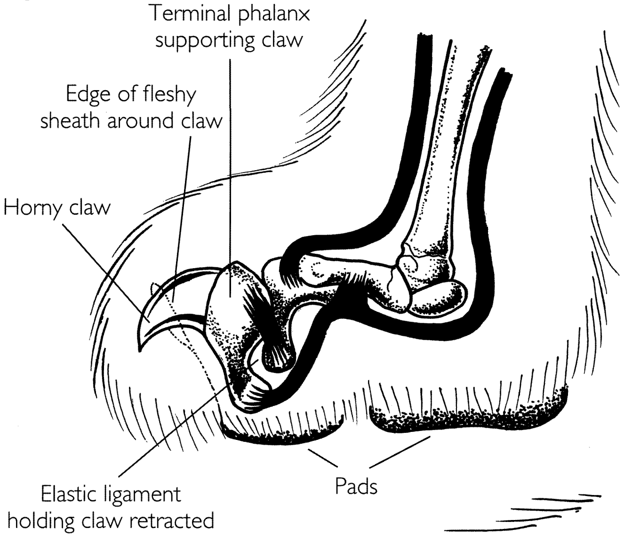
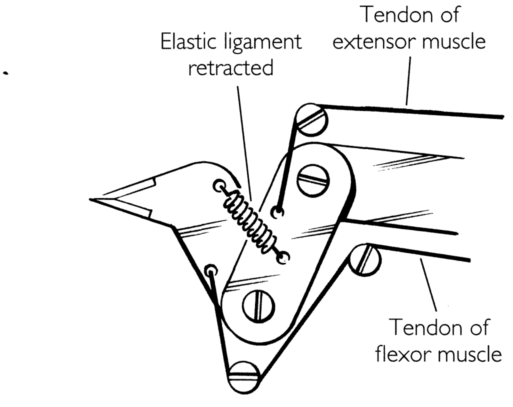

Terminal phalanx supporting claw
Edge of fleshy sheath around claw
Horny claw
Elastic ligament holding claw retracted
Pads

Figure 1b



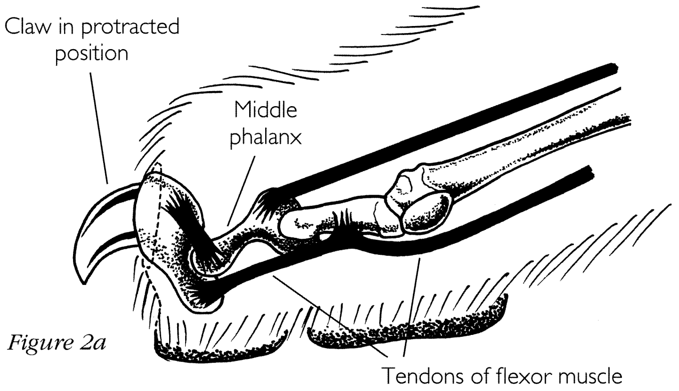


Figure 2a

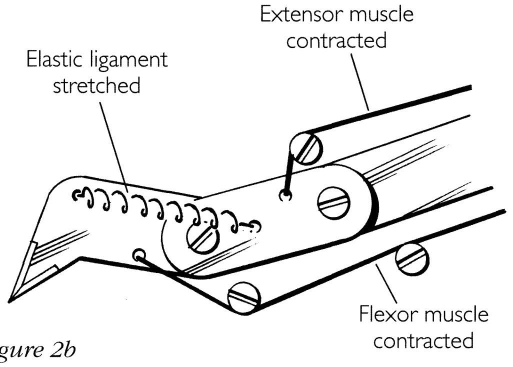


Figure 2b

2 Retractile claws: a masterpiece of design

When they are not being used, cats retract their claws to prevent them getting worn down. Spring-like elastic ligaments keep the claws above the ground for most of the time. The design is energy efficient because the claws are retracted when the ligaments are in a relaxed position (see figure 1a). When in use, the extensor and flexor muscles contract, and the ligament stretches to extend the claws from their sheath (see figure 2a). The design is basically the same as that used in a jacknife (see figures 1b and 2b).

out (Deuteronomy 8:4), but the Bible says it happened! And sometimes we are given insights into what that perfect, unspoiled world might have been like. In the case of cat's claws and jaws we are fortunate enough to have some clues—because they have other important purposes besides catching living prey.

The sharpness of the retractile claws allows most cats to climb well. Most cats live and hunt almost entirely on the ground. However, all of the big cats will climb into trees to rest and sleep if the trees are easily ascended. The young of big cats will climb even more readily than older, larger cats. Domestic cats, of course, are also adept climbers. It seems probable that cats originally used their claws to allow them to rest and sleep in trees. Perhaps they even fed on the fruit there. There are many recorded cases of cats eating plants, including jaguars and wild cats eating avocado, and civet cats eating all kinds of fruit.[3] If cats ate fruit before the Fall, this would help to make sense of their sharp teeth. Many animals today have similar teeth that are used for eating fruit, not meat (such as the fruit bat and certain species of monkey). Cats may have originally been fruit-eaters and only began to use their sharp teeth and claws on animal prey after the Fall. This is, of course, speculation about a world that has gone and of which we have no direct experience. Nevertheless, the Bible tells us that this world existed and functioned, so it is not wrong to think about it and make reasonable hypotheses.

So next time the moggie scratches the furniture, or proudly presents you with a dead mouse on your clean kitchen floor, remember that their claws and jaws were put to better uses before the Fall!

Footnotes

1. For example, Eugenie Scott, an anti-creationist campaigner and physical anthropologist, writes, 'Observations by naturalists, evolutionarily-inclined or not, show nature as a not very peacable kingdom. Some really yucky things go on out there, and it is difficult to imagine them being the direct product of a beneficent creator God who prizes humankind above all else in creation…A rather unpleasant-looking videotape being advertised currently appears to be a sequence of scenes wherein animals claw, bite, crush, slash, and tear one another apart, for food, defense, sexual competition—or fun. A killer whale seizes a seal in its mouth and smashes it against the beach; a male lion rushes into a group of cubs sired by another and rips them apart; hyenas tear the throat out of a zebra colt. Just another day on planet earth. The more we learn about the natural world, the more

it appears to be a not very humanely-designed place—with or without the insight of natural selection theory.' (Scott, E. C. (1993). *Darwin prosecuted: a review of* Darwin on Trial *by Phillip E. Johnson.* Creation/Evolution, 13(2):45.)

2. Why should the whole creation have been involved? Some humanists suggest that it is unjust of God to curse all of creation because of man's sin. Eugenie Scott (see reference in footnote 1) asks, 'if man is being punished for the sins of Adam, why does animal life have to suffer so much?' There are two points that can be made here: (1) Mankind is not being punished for Adam's sin—we are held accountable for our own sin (Ezekiel 18:20). However, we inherit from Adam an innate tendency to disobey God. We sin because we are sinners by nature. (2) The whole universe is cursed because it was made for the benefit and use of man. Man was made to exercise dominion over the creation, so when he sinned he dragged the creation with him.
3. Woodmorappe, J. *For cat lovers (ailurophiles).* http://www.rae.org/catlover.html [accessed on 15.12.98]. Woodmorappe cites a compilation of cases by van der Pijl, L. (1982). *Principles of dispersal in higher plants*, Springer Verlag, Berlin, p.54.

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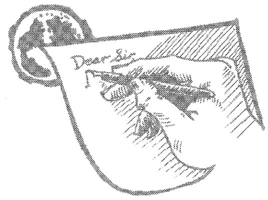

Mark Simons, Scarborough

The titles of the articles in *Origins* are very attractive, but the text does appear daunting to non-technical readers. (You must have many). Shorter, and spaced paragraphs, are much more inviting than dense text. I recall looking across a small lake in Wales, and thinking how nice it would be to swim to the other side. I think I might have managed it, but I knew the middle would be deep and I would be tired. I turned away, disappointed by my lack of confidence.

My kind regards, and appreciation of your work.

[*Editor:* We are conscious that we have many readers like Mark who support and appreciate our work, but feel that our magazine is not designed for them. We are trying to remedy this, and hope you will like the changes we are making to *Origins* over the coming months. Beginning with this issue, we are moving to three editions per year, two of which will be aimed at a 'popular' readership with the third addressing more technical matters. Please continue to stick with us as we make these changes and let us know what you think of them.]

Graham Wilson, Gullane, East Lothian

I write to express my appreciation of Steven Robinson's earlier article and his current response on the topic of genealogy. While not necessarily accepting a figure of 18,000 years since the Flood, I do feel that we should not commit ourselves to any particular figures. Suggested dates for the Flood (and Creation) are simply no more than fallible estimates and where Scripture is silent, we should be likewise!

Steven is also correct to assert that population statistics do not constitute evidence for chronological purposes. In his response he refers to conditions such as war, famine, disease, etc, and their impact on population growth. There is, however, another vital factor to be taken into consideration. Over the millennia, Israel increased in numbers by means of 'conversions' and no doubt lost growth as others left Judaism. History records that in AD 740 Judaism gained large numbers of people, when King Bulan of gentile Khazaria (in Europe) opted for the Jewish religion. This means, in effect, as the encyclopaedias stress, there is no such thing as a special 'Jewish race' on which to seek to build meaningful statistics.

Prayerful good wishes to all the team for 2001.

[*Editor:* We have had a variety of responses to Steven Robinson's articles in *Origins* 26 and 29. Some, like Graham, have welcomed these ideas and share Steven's view that the biblical genealogies may be incomplete. However, other readers were clearly disturbed by Steven's proposal that there are gaps in the biblical genealogies and that the fossil-bearing sediments were laid down after Noah's Flood. Perhaps some editorial comment is appropriate.

We ought to emphasise that articles published in *Origins* do not necessarily reflect the position of the Society or the editorial team. Nevertheless, contributors must subscribe to our *Basis of Faith* and *The Creation Manifesto*, which together describe the Society's doctrinal position. Within this scriptural framework there is a diversity of opinion about how the geological and biological evidence should be interpreted. The Bible does not indicate precisely which part of the geological record can be identified with the global Flood—that is a matter on which the Scripture is silent and is a legitimate area for debate and discussion. As a Society we stand for the full historicity and inerrancy of the Genesis account of origins. We believe that our apologetic arguments for the Genesis account will be strengthened by an earth history model that is able to correlate the biblical and geological records, without doing violence to either. Steven's articles were intended to advance discussion to that end.]

Trilobites: the 'Beetles' of the Palæozoic

Paul Garner

TRILOBITES have long been a source of fascination and speculation. As far back as 1698 a fossil trilobite from Llandeilo was described in a scientific journal, rather inaccurately as it turned out, as 'the sceleton of some Flat-Fish'. Since then, we have learned a great deal about these extraordinary animals. Although they are found in rocks that are said to be very ancient (hundreds of millions of years old), they were far from 'simple' or 'primitive'.

On the contrary, they were sophisticated creatures with complex anatomy, life cycles and habits. Many thousands of species are now known, and more are discovered every year. They are perhaps the most diverse of all fossil groups and they have much to teach us about the geological history of the Earth. As we shall see, trilobites also pose very serious challenges to evolutionary theory.

What is a trilobite?

Trilobites are an extinct type of arthropod, a group that also includes more familiar animals like lobsters, crabs, insects, and spiders. Arthropods are animals with a hard outer coat (exoskeleton) and jointed legs; the name 'arthropod' comes from the Greek for 'jointed foot'. Trilobites are found worldwide and are among the most common of Palæozoic fossils; the Palæozoic is that part of the geological record from the beginning of the Cambrian to the end of the Permian (figure 1). In Palæozoic rocks, trilobites are almost as common and varied as beetles are today. For this reason the trilobites, though they are quite distinct from any modern arthropods, have been nicknamed 'the beetles of the Palæozoic' (Fortey, 2000).

Eon	Era	Period
Phanerozoic	Cenozoic	Quaternary
		Tertiary
	Mesozoic	Cretaceous
		Jurassic
		Triassic
	Palæozoic	Permian
		Carboniferous
		Devonian
		Silurian
		Ordovician
		Cambrian
Proterozoic		
Archæan		
Pre-Archæan		

Figure 1. A simplified geological column, with the Palaeozoic highlighted. Trilobite fossils are found only in Palæozoic sediments

Trilobites were amazingly complex animals. The group takes its name from the three lobes of the trilobite body (figure 2). The 'shell' (carapace) was divided into three lengthwise strips by a pair of grooves running along either side of the midline. Usually, the body was also divided into three sections from front to back. At the front was a headshield (called the cephalon); then a series of segments making up the body (thorax); and finally the tail (pygidium). Trilobite appendages (legs and antennae) are not often found as fossils because they were delicate structures that did not fossilise well. Nevertheless, in some exceptional cases appendages have been preserved (figure 3); they were first described in 1876 and are now known from about 20 species (Clarkson, 1986, p.318). The antennæ were single-branched (uniramous) and flexible, whereas trilobite legs were two-branched (biramous). One of the branches was the walking leg and the other was the gill branch, although the latter may have had uses other than just breathing. Additional information comes from fossilised tracks and trails, which cast light on how trilobites may have walked, fed, and burrowed (see inset box 1).

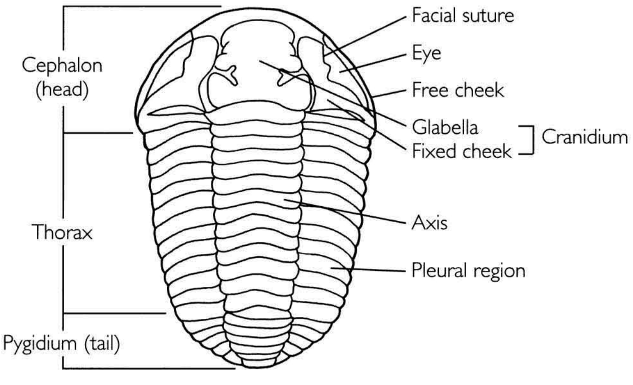

Figure 2. Basic trilobite anatomy. This is the trilobite Calymene, with the various parts labelled.

Moulting and development from larva to adult

Trilobites had a hard outer coat which was not able to expand as the body grew. Therefore, like many other arthropods, trilobites periodically 'moulted' to shed their outer coat and grow a new one (this process is called

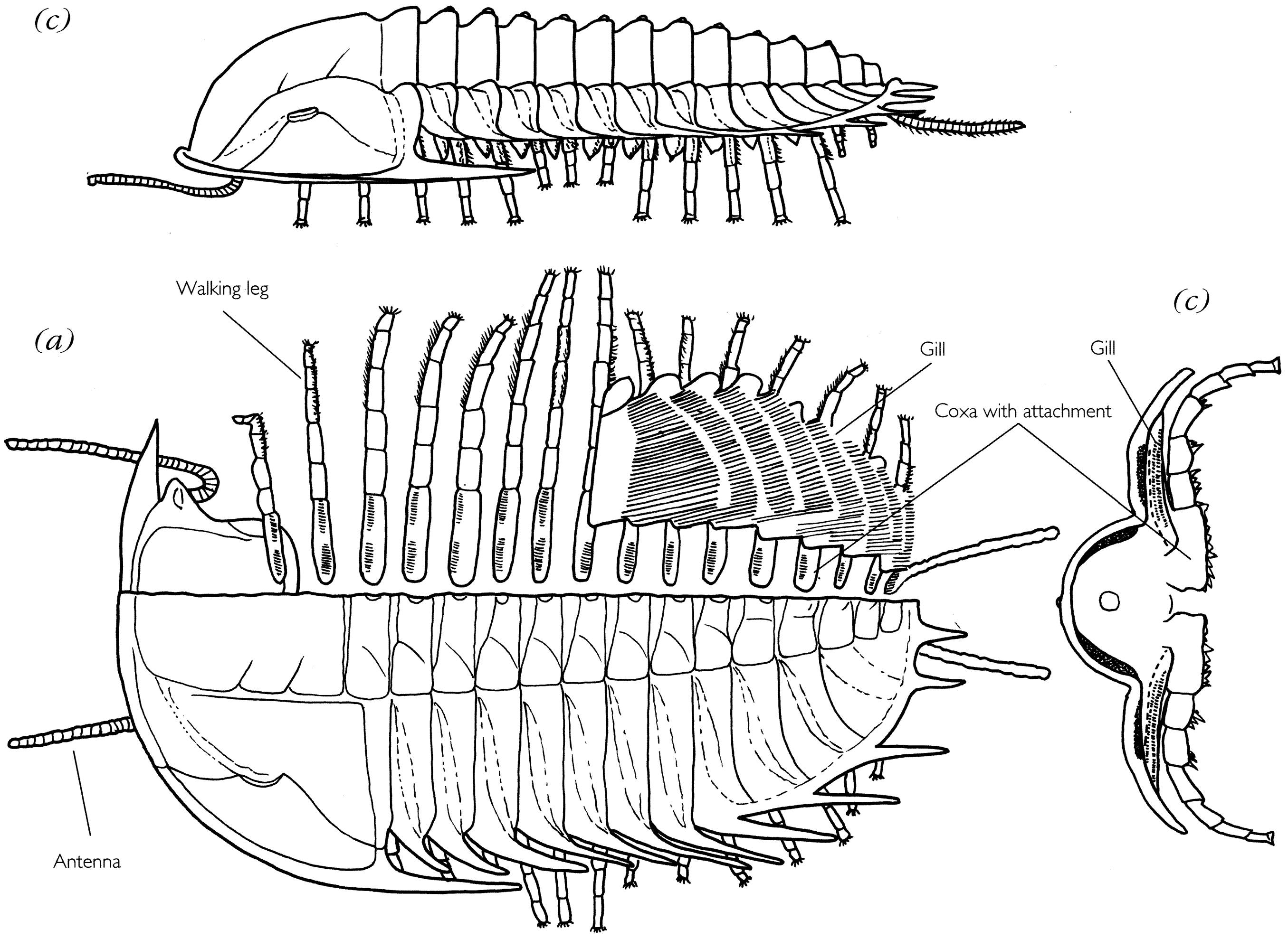

Figure 3. The trilobite Olenoides serratus *(Middle Cambrian) showing reconstructed appendages: (a) view from above with part of the carapace removed, showing the appendages in place and the gill branch lying above the leg; (b) cross section; (c) side view.*

ecdysis). While the trilobite was in the 'soft shell' stage it must have been very vulnerable to predators. It also means that for every trilobite that lived, there were many shed 'moults' that could potentially be fossilised. This may help to explain why trilobite fossils are so common. Shed 'moults' are also useful to scientists in reconstructing the development of trilobites from the earliest larval stages to the adult form (Whittington, 1957). The earliest stage is called the protaspis, a small disc less than 1 mm across. This stage encompasses all the growth up to the time the head divides from the rest of the body. During the second phase (the meraspis) the segments of the thorax began to develop. As each new segment formed, the trilobite larva had to moult. Once the final segment was in place, the adult form was reached and this is called the holaspis stage. Growth continued, however, and the trilobite would have had to moult from time to time until its death. Figure 5 shows a series of 'moults' from the Ordovician trilobite *Shumardia pusilla*.

This system of development is staggeringly complex. Recent laboratory studies have revealed the genes ('HOX genes') that control the sequence in which the various organs develop as animals grow from embryo to adult. To the astonishment of scientists, this control system is similar in animals as different as fruit flies, fish, and human beings! It is almost certain that trilobite development would have been under the control of HOX genes too. The HOX control centre would have directed the growth of each trilobite from a single fertilised cell. It would have 'told' the developing embryo which cells would form the head, and where to place the legs, the antennæ, and the various body segments. Thousands of genes must have worked together in a complex inter-related system to ensure that the right parts of the body developed at the right time and in the right place. This complexity defies evolutionary explanations (Chadwick and DeHaan, 2000).

Trilobite eyes

Although some species were blind, many trilobites had well-developed eyes. Trilobite eyes were compound eyes, made up of many lenses, often pointing in different directions to give a wide field of view. They would have been very sensitive to motion and may have been important to trilobites in detecting predators. There were two main types of trilobite eye: holochroal and schizochroal. Most trilobites had holochroal eyes, which were similar in design to those possessed by modern arthropods. Holochroal eyes were made up of numerous round or polygonal lenses, all closely packed and covered by a

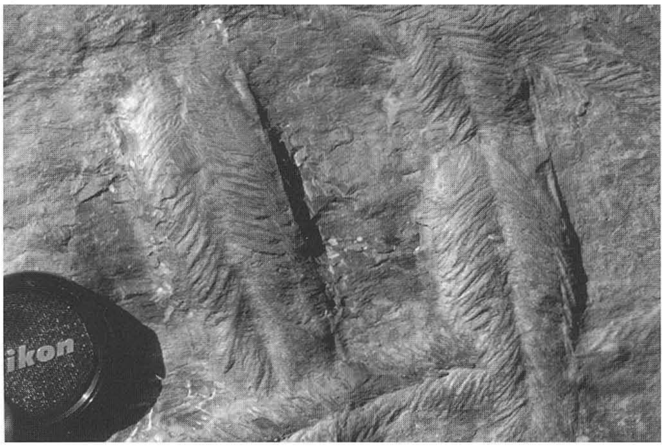

Figure 4. Intersecting Cruziana *trails in Palæozoic sediments of northern Spain. A 'ploughing' trilobite probably made these trails by pushing backwards with its legs. Photograph courtesy of Michael Garton.*

There are several types of fossil markings that are thought to be those of trilobites, although it is difficult to be certain because it is rare to find an animal preserved with a track. The commonest is a long 'furrow' called *Cruziana* (figure 4), which is usually considered to be a trail left by a trilobite 'ploughing' through the soft sediment. *Cruziana* is the right size and shape to have been made by trilobites and its varying abundance through the fossil record seems to match the abundance of trilobites. However, this is indirect evidence and some scientists think that another creature may have been responsible (Whittington, 1980). Another marking, called *Rusophycus*, is a shallow, oval-shaped hollow interpreted as a trilobite burrow or resting trace. It is sometimes found at the end of a *Cruziana* trail. In a few cases, it is possible to identify a trail-maker more clearly. For instance, walking traces found in the Hunsrückschiefer (Lower Devonian) of Germany can be matched closely with the well-preserved bristly legs of the trilobite *Phacops*, specimens of which are also found in this deposit.

single corneal membrane. Schizochroal eyes, on the other hand, were unlike any seen in modern-day animals and were possessed only by trilobites of the suborder Phacopina (Ordovician-Devonian). In schizochroal eyes the lenses were large and separated from one another, each with its own corneal covering. Trilobites with schizochroal eyes appear later in the fossil record than those with holochroal eyes, but there are no known intermediate forms between the two.

The lens of the eye in vertebrates (back-boned animals) can change shape to focus on objects at varying distances. By contrast, the schizochroal eyes of trilobites had rigid, crystalline lenses. This presents an unusual problem—a simple thick lens of calcite crystal is unable to focus incoming light into an image. However, the schizochroal eye was cleverly designed to solve this problem. To allow the eye to focus, the trilobite had two lens layers, each with a different refractive index. The shape of the lens layers enabled the eye to correct the focusing problem, with minimal distortion of the image. The shapes of some trilobite lenses closely match those produced by optical scientists about 350 years ago to answer similar needs for man-made lenses (Clarkson and Levi-Setti, 1975). In particular, the designs of René Descartes (1586-1650) and Christian Huygens (1629–95) have been identified in trilobites (figure 6).

> 'The elegant physical design of trilobite eyes employ Fermat's principle, Abbe's sine law, Snell's laws of refraction, and compensates for the optics of birefringent crystals. Thus, trilobites could see an undistorted image under water. Imagine being able to see with undistorted vision in all directions, being able to determine distance in part of that range, while, at the same time, having the optimum sensor for motion detection. Such a vision system would have all the evidences of being constructed by a brilliant designer!' (Austin, 1994, p.145).

This is a source of amazement even for committed Darwinists. In a recent review of Richard Fortey's book on trilobites, one geologist wrote:

> 'The chapter on trilobite eyes is quite astonishing … I find it almost unbelievable that such a sophisticated development could derive solely from Darwinian natural selection' (McCall, 2001).

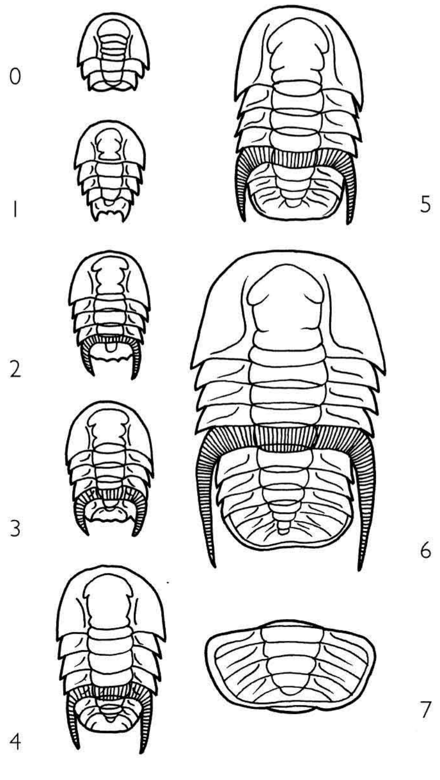

Figure 5. Development in the trilobite Shumardia pusilla *(Ordovician). A series from degree 0 meraspis to holaspis; 0-5 are the meraspides, 6 is a holaspis. The isolated tail 7 shows changes in segmentation after the full complement of thoracic segments has been reached.*

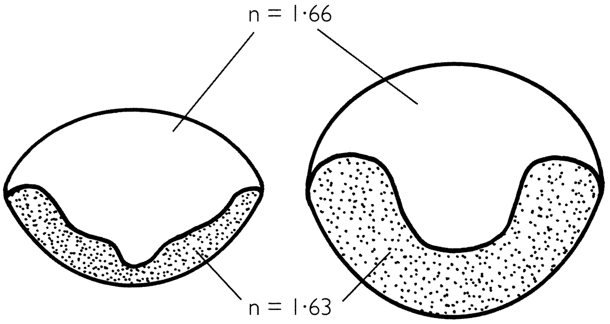

Figure 6. Trilobite eyes. Lenses of Dalmanitina socialis *(Ordovician) and* Crozonaspis struvei *with intralensar bowl (shaded), conforming to ideal correcting lenses of Descartes and Huygens respectively. The small refractive index difference between bowl and upper unit allows light to be focused sharply.*

Where did trilobites come from?

Trilobites were evidently very complex, yet they appear as some of the 'earliest' multi-celled animals with hard parts. This presents a serious problem to Darwinists, who would not anticipate such complexity so early in the fossil record. What is more, there are no fossils showing how the trilobites evolved from some earlier, less complex creature. Most evolutionists think that trilobites evolved from some kind of segmented worm (annelid; see figure 7). However, there is virtually no support for this idea from the fossil record. Instead, they appear abruptly with little sign of evolutionary ancestors.

> '*Almost nothing is known* about the ancestors of trilobites. In common with other arthropods *it may be presumed* that trilobites were *possibly* derived from the same ancestors as the annelids, and the Ediacara genus *Spriggina*, which has a large and rather plate-like head *may* have been somewhere in the ancestral line, *but this is only speculation.*' (Clarkson, 1986, p.330; emphasis added)

The first trilobites to appear in the fossil record, in the Lower Cambrian, belong to the group called the Olenellina. They are highly advanced animals and distinct from other basic types. Fortey (2000, p.83) says that they 'already had a sophisticated visual system'. The sudden appearance of such animals in the fossil record is an unresolved problem for evolutionists (see inset box 2). Trilobites are so complex that some Darwinists estimate they must have been evolving for up to half a billion years before they appear in the Cambrian. However, there is no fossil evidence for this, so they argue that the trilobite ancestors were soft-bodied worm-like or larvæ-like forms that did not fossilise well. Other Darwinists 'read' the fossil record more literally, and think that trilobites and all the other Cambrian animals evolved very rapidly (in no more than ten million years). The problem with this is that there is no known mechanism for such rapid evolution.

What we actually find in the fossil record fits well with the creationist view that each kind of animal, including trilobites, was created separately. All trilobites were marine, so they may have been created on the fifth day of Creation Week with all the other sea creatures (Genesis 1:20-23).

2

'The seemingly sudden appearance of skeletonized life has been one of the most perplexing puzzles of the fossil record. How is it that animals as complex as trilobites and brachiopods could spring forth so suddenly, completely formed, without a trace of their ancestors in the underlying strata? If ever there was evidence suggesting Divine Creation, surely the Precambrian and Cambrian transition, known from numerous localities across the face of the earth, is it.' — Peter Douglas Ward. (1992). *On Methuselah's Trail: Living Fossils and the Great Extinctions*. (Foreword by Steven M. Stanley). W. H. Freeman and Company, New York, p.29.

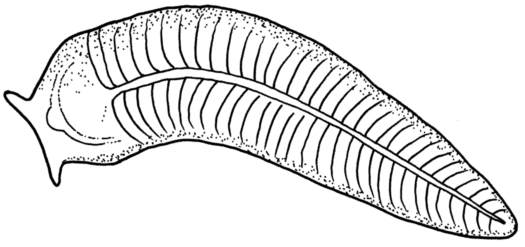

Figure 7. Spriggina, *an annelid (segmented) worm from the Precambrian fauna of the Ediacara Hills of South Australia. Some Darwinists have speculated that* Spriggina *might be the ancestor of the trilobites.*

The variety of trilobites

There are over 15,000 known trilobite species, which have been grouped into eight main orders (see inset box 3). New species are discovered and described every year. Although they share many features in common, there is a great deal of variation on the trilobite 'theme'. Most trilobites were less than 10 cm long, but the smallest type was just under 1 mm long *(Acanthopleurella)* and some types reached over 70 cm. There were smooth trilobites and 'warty' trilobites, long trilobites and wide trilobites, bulbous trilobites and streamlined trilobites. Some species had only a few thoracic segments, while others had as many as sixty. The diversity of forms probably reflects different styles of living. Many trilobites were burrowers, living in fairly shallow water and grubbing among the soft sediment on the sea floor. Some types, such as *Cyclopyge*, had very large eyes for all-round vision and may have been swimmers. Other species were blind and may have been active at night or lived in cavities in reefs. Some trilobites, such as the odontopleurids, were spiny. It is probable that the spines helped to prevent the trilobite from sinking into soft sediment on the sea bottom. They may also have served as protection from predators. The Creator God who made the trilobites equipped them for life in a wide variety of different environments and habitats. We see in this His loving care for the creatures He had made.

How were trilobites fossilised?

Rapid burial is nearly always required to form a fossil. Unless a creature is buried at, or soon after, death, it is likely to start to decay and decompose. Also, other animals may scavenge it. Before long, very little of the creature is left to fossilise. Trilobites were no different, and rapid burial is likely to have been required for their fossilisation, especially in instances where their soft parts are also preserved. In some layers fossils are found in exceptional numbers or are particularly well preserved. The German palæontologist Adolph Seilacher called these layers *Fossil Lagerstätten* (roughly translated as 'fossil bonanzas'). Such layers are of great importance to geologists because they provide a rare 'window' into the past. Typically only a part of any living community is likely to be preserved as fossils (those with hard parts). In 'fossil bonanzas' exceptional conditions may preserve a wider range of species, including soft-bodied or thin-shelled creatures. Several layers of this kind are known. One is the Hunsrückschiefer (Lower Devonian) of Germany, in which starfish, crinoids, trilobites, crustaceans and many other animals have been beautifully preserved in pyrite ('fool's gold'). Professor W. Stürmer of Erlangen has used X-ray techniques to obtain stunning photographs of the soft parts of animals from this slate deposit. Much of the detailed information about trilobite legs came from these photographs. Perhaps the best known 'fossil bonanza' is the Burgess Shale (Middle Cambrian) of British Columbia, Canada, which has yielded many arthropods including trilobites. Another 'fossil bonanza' that has given scientists invaluable information is the Utica Shale (Lower Ordovician) of New York State. Certain horizons within this shale deposit abound with specimens of a trilobite called *Triarthrus*, with legs and antennae exquisitely preserved in iron pyrites. It is likely that rapid burial by sediments played a role in preserving these beautiful fossils:

> '... the covering of iron pyrites must have happened very quickly, otherwise the legs would have decayed away. The animals themselves probably died suddenly, and were then protected from the activities of scavengers, which normally pick carcases apart even before the decay bacteria can get to work. There were clearly special conditions on the Ordovician sea-floor in New York State at this one moment in geological time.' (Fortey, 2000, p.63-64)

In many cases, trilobites were evidently buried alive. Clusters of trilobites *(Phacops rana)* from the Silica Shale in Ohio may have 'gathered to mate before being overwhelmed by disaster' (Fortey, 2000, p.76). Many trilobites were able to roll up into a protective ball when they were in danger. In some species the enrolment system was very elaborate, with a 'tooth and socket' arrangement on the head and tail which helped to lock the 'ball' into place. Enrolled trilobites are quite commonly found as fossils. These animals were still alive when they were buried, and were probably trying to protect themselves from the sediments that were engulfing them. Burial by rapidly accumulating sediments fits well with the short time-scale envisaged by creationists for the geological record.

3

The eight trilobite orders
(Gon, 2000)

Agnostida, Lower Cambrian to Upper Ordovician (Ashgill)
Redlichiida, Lower Cambrian to Middle Cambrian
Corynexochida, Lower Cambrian to Middle Devonian
Ptychopariida, Lower Cambrian to Devonian (Frasnian)
Phacopida, Lower Ordovician (Tremadoc) to Upper Devonian (Famennian)
Lichida, Lower Ordovician (Tremadoc) to Upper Devonian (Frasnian)
Asaphida, Middle-Upper Cambrian boundary to Upper Ordovician-Lower Silurian
Proetida, Lower Ordovician (Tremadoc) to Permian (Tartarian)

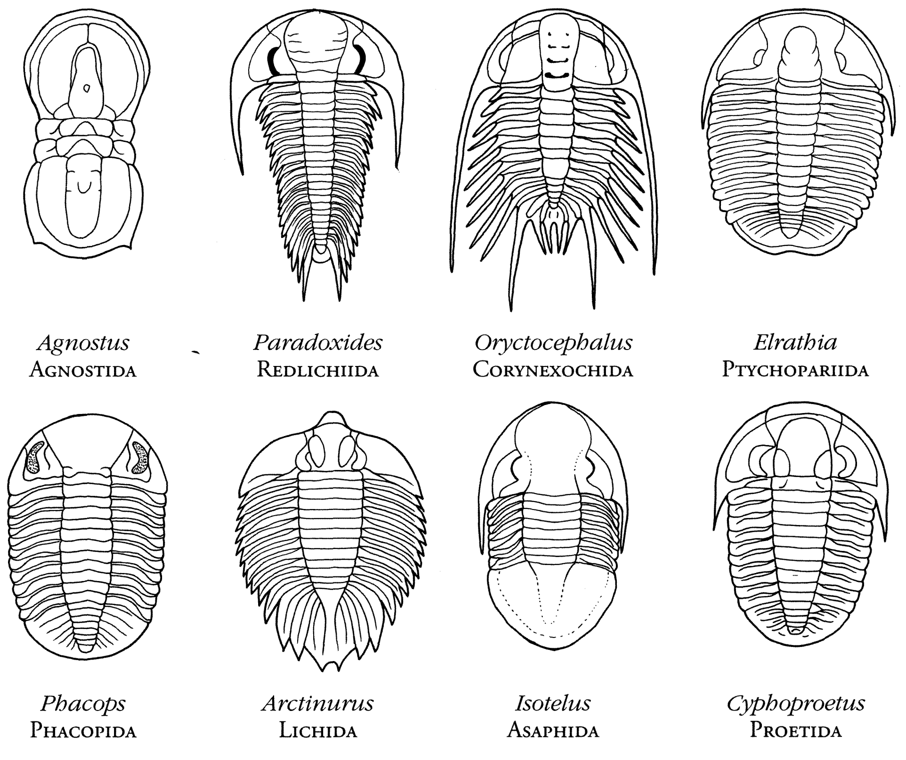
Agnostus AGNOSTIDA
Paradoxides REDLICHIIDA
Oryctocephalus CORYNEXOCHIDA
Elrathia PTYCHOPARIIDA
Phacops PHACOPIDA
Arctinurus LICHIDA
Isotelus ASAPHIDA
Cyphoproetus PROETIDA

Figure 8. Representatives of the eight trilobite orders (after Gon, 2000). Genus names are italicised, ordinal names are in small capitals.

How geologists use trilobites

Trilobites are not distributed randomly throughout the fossil record. They are found only in Palæozoic rocks. Within the Palæozoic, groups of trilobites come and go. Assemblages of trilobites in the Cambrian are markedly different from those in the Ordovician, which in turn are distinct from those of the Silurian, Devonian, Carboniferous or Permian. Darwinists interpret this succession as the result of evolution, punctuated by episodes of extinction, over many tens of millions of years. They believe that all trilobites evolved from a common ancestor and that trilobites have diversified throughout geological time. Biblical creationists understand this succession somewhat differently, because they do not accept the standard millions-of-years time-scale for these sediments. It is not my intention to discuss here alternative creationist models for this succession. Suffice it to say that some creationists think that the Palæozoic sediments were laid down by the Flood and propose that the fossil succession represents the order in which trilobites were successively buried during the catastrophe, while others see it as a record of variation within the trilobite kinds after the Flood, as the world was re-colonised.

Whatever the explanation, there does seem to be a consistent sequence. This allows geologists to use trilobites as 'zone fossils', especially in the Cambrian and Ordovician. Trilobite species are good 'zone fossils' because they are abundant, easily recognisable and often have short ranges through the rock layers. The main disadvantages are that trilobite populations are often limited to particular geographical regions ('provinces') and are commonly restricted to certain sediment types (shallow water 'shelly' sediments); these make the matching of layers (correlation) difficult over long distances.

Conclusion

Trilobites are the favourite fossils of many enthusiasts. While they are not as 'glamorous' as dinosaurs, they have the advantage of being much more common in the fossil record. They are also easier to collect! To summarise, here are five things we can learn from trilobites:

- Trilobites were every bit as elaborate as any modern animal. Their bewildering complexity points to intelligent design and defies evolutionary theory.
- There is a certain beauty and elegance about trilobites, and we can perceive the hand of the Creator in the remarkable designs that have equipped these creatures for their various lifestyles.
- Trilobites appear abruptly in the fossil record with no trace of evolutionary ancestors. Creation, rather than evolution, is better able to explain the absence of earlier transitional forms.
- Trilobites display unity of form, and yet great diversity, suggesting that they have faithfully reproduced after their kind (Genesis 1).
- In many cases there is evidence that trilobites were preserved by rapid and catastrophic burial. This is consistent with the short time-scale for the deposition of the fossil-bearing sedimentary layers proposed by creationists.

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The Author

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More 'ape-man' claims

An international team of scientists claims it has found the fossil remains of the earliest hominid (human ancestor) in the Middle Awash area of Ethiopia. The fossils include fragments of a jawbone with teeth, several hand and foot bones, parts of an arm bone, and a piece of collar bone.

Until February 2001, evolutionists believed the earliest known hominid was *Ardipithecus ramidus*, dated at 4·4 million years old. Then scientists in Kenya claimed to have found a 6-million-year-old hominid, which they called *Orrorin tugenensis*, and controversially suggested that *Ardipithecus* was more closely related to chimpanzees than humans.

However, the discoverers of the new Ethiopian fossils say that their finds support the 'human ancestor' status of *Ardipithecus ramidus* and cast doubt on that of *Orrorin*. It seems that there is no consensus among the experts on how these various creatures are related to one another (if at all).

The pattern emerging here is one that will be familiar to *Origins* readers. First, confident and exciting claims are made, then overblown media headlines are written, and only later are the finds quietly re-evaluated and their status downgraded.

The Scandalous 'Flat Earth' Myth

David Tyler

MY five-year old son was looking at his newly acquired book on *Tremendous Treks*. Featured stories were the wilderness wanderings of the Israelites, Hannibal's journey over the Alps, the Silk Road to and from China, and many others. One particular journey caught my eye: that of Magellan sailing around the world in 1519 AD.

The opening paragraph makes it clear that 'flat earth' beliefs were widespread prior to the years when pioneer sailors explored the earth: 'Most sailors used to think the world was flat, and that if they sailed too far they would fall off the edge'. In this way, the book contributes to sustaining a myth that the medieval world believed in a flat earth and that brave pioneers were necessary to prove that the earth is a sphere and that it is possible to sail around it.

The reality is that nearly all scholars of the medieval period, contemporary and past, have concluded that the medievals believed the world to be round. So how did we get into the situation where a widely held belief, that the medievals thought the world was flat, is so devoid of factual support? The answer to this question is provided in a readable and authoritative historical study, *Inventing the Flat Earth*, by Jeffrey Burton Russell (1991).

Russell is Professor of History at the University of California, Santa Barbara. His specialist knowledge is in the intellectual history of the medieval world. He describes what he calls the 'Flat Error': a modern belief about earlier generations that tells us more about ourselves than about people in the past. The 'Flat Error' deserves to be called scandalous, for its advocates have effectively maintained a myth to satisfy their own biases and belief systems at the expense of past generations that do not deserve the disparagement.

Historians of science cannot fail to recognise the important influence of Greek philosophers on those who came after. Aristotelianism in particular was extraordinarily powerful as a philosophical system and Aristotle clearly taught the earth's sphericity. Nearly all the Greeks who had a view on the shape of the earth agreed that it was a sphere. Eratosthenes' measurement of the earth's circumference (250,000 stades) was very close to the modern figure. Ptolemy came up with a smaller value (180,000 stades). These calculated dimensions were known to the medieval world. It was considered very important for medieval students to learn geography, where it was part of their studies in astronomy and geometry. Medieval leaders (Bede, Roger Bacon, Thomas Aquinas, Jean Buridan, Nicole Oresme, Giles of Rome and others) all affirmed the earth's sphericity. It is also relevant to note that the kings of the Early Middle Ages held a royal orb. The golden ball represented the spherical earth and the cross that was part of the orb symbolised Christ's sovereignty. The message conveyed was that the king held the orb as one entrusted by God with governance.

The early church leaders saw no need to distance themselves from the Greeks' understanding of the earth's sphericity. The only identifiable flat-earthers are Lactantius (*c.* 265-345), Cosmas Indicopleustes (*c.* 540), Severian of Gabala (*c.* 380), possibly Theodore of Mopsuestia (*c.* 350-430) and possibly Diodore of Tarsus (d. 394). Of these, Lactantius and Cosmas are the prime characters appearing in the flat earth literature. Russell discusses both of these characters in a sympathetic way, pointing out that neither was influential in their own time nor in the medieval period. How then did those responsible for the 'Flat Error' create such a serious misrepresentation of the influence of these men?

According to Russell, the first seed was sown in innocence by Copernicus in *De Revolutionibus* (1543). 'In the preface, Copernicus used Lactantius to illustrate how the ignorance of opponents of the round earth was comparable to that of those insisting on geocentricity in his own time' (p.64). Note that Copernicus did not suggest that Lactantius was in any way typical, nor did he point to any contemporaries with similar views, nor was anyone mentioned who could have been involved in discussions regarding pioneer ocean voyages. Nevertheless, some later writers picked up the name of Lactantius and made much of his bigotry and opposition to the truth.

The ground on which the 'Flat Error' grew was prepared by Compte (1798-1857). Auguste Compte developed the philosophy of positivism, with its concept of progress, step by step, from superstition to science. This led to the idea that 'religion'—in particular Catholic and Protestant Christianity—was but a step beyond superstition and definitely a step back from real science. Religion had to be swept away if mankind was to progress to truth. This approach led to the metaphor of 'warfare' to describe the relationship between science and religion. Such a conflict was first articulated by William Whewell, Vice Chancellor of Cambridge University in 1837. Important developments of the warfare metaphor were by John Draper in *The History of the Conflict between Religion and Science* (1873) and by Andrew Dickson White in his *History of the Warfare of Science with Theology in Christendom* (1896).

All three of these men pointed at Lactantius and Cosmas as influential leaders of the flat earth belief. Their historical errors are analysed and discussed helpfully by Russell. It has to be said that the 'warfare thesis' was a largely successful exercise and several generations of people have soaked up the idea that Christianity is inherently anti-scientific and that it has frequently acted to oppose science.

There is also a very significant mythology associated with Christopher Columbus. It has been argued that he was the pioneer who defied warnings about falling off the edge of the earth—and thereby discovered America in 1492 AD. How did this version of events come to be invented? Russell identifies an American, Washington Irving, as being very influential in getting the public to accept the idea of opposition to Columbus' voyage coming from flat-earthers. Irving wrote *History of the Life and Voyages of Christopher Columbus* (1828) which purported to be history, but was actually romantic fiction loosely based on history. In academic circles, the French scholar Antoine-Jean Letronne is identified as winning over several historians following an article he published in 1834.

Knowing that historians put the record straight 50 years ago, why has the 'Flat Error' been so persistent in the educated world? Russell is not content with yet again putting the record straight—he is anxious to learn some lessons! The first three lessons are quite well known from other contexts and need not be developed here. They are:

1. Too few scholars work with primary sources and the errors of other writers are repeated and propagated.
2. Scholars are often led by their biases more than by the evidence.
3. Sociological and cultural factors need to be recognised in scholarly work, and scholars must beware of making value-judgements based on today's norms.

Russell's fourth point is that some scholars have carried personal convictions about cultural superiority into their work. This has led them to undervalue the past and to erroneously attribute certain values and beliefs to those cultures. In the case of the 'Flat Error', there has been a conviction that the medieval period was a dark age, that scholarship was at a low ebb, and that superstition prevailed. The problem has been that there is a large gulf between historical scholarship and these cultural convictions.

Fifthly, cultural myths have a life of their own and can reinforce each other. The 'Flat Error' has been entangled with other erroneous ideas such as the Dark Ages, the opposition of Christianity to science, and so on. This web of falsehood conceals a deeper agenda. Russell suggests that advocates of the 'Flat Error' may be struggling with fears far worse than the fear of falling off the edge of the earth. They need to believe in 'progress' in order to give meaning to life. They need to believe that our generation is superior to those that have gone before—and that the further back in time we go, the greater the ignorance. Facing up to the implications arising from the 'Flat Error' comes as an enormous cultural shock to these people.

Although Russell does not develop this thought, it occurs to me that there are many analogies here with evolutionary naturalism. The theory has to be true and its advocates find it difficult, if not impossible, to accept that they are not reading the data of biology correctly. Darwinian mechanisms may explain the 'fine tuning' of adaptation, but they are woefully inadequate for explaining the origins of the phyla, classes, orders and families. Associated 'scientific' myths abound: Haeckel's biogenetic law, the significance of industrial melanism in the peppered moth, the 'Beak of the Finch' story, the adaptive landscape metaphor, the 'simplicity' of single cells, and so on. In all these cases, erroneous or misleading ideas have been perpetuated to support the theory long after the inadequacies have been pointed out.

Opponents of biblical revelation still find it convenient to use the 'flat earth' allegation as a cheap way of putting Christians on the defensive and asserting their own superiority. This review article is written to say that we have no need to be apologetic about this past 'error'. Even though those times were not without doctrinal confusion, priestly delusions and cultural superstitions, belief in the Bible as God's revealed truth did not lead people to adopt a superstitious fable about a flat earth. God's word is true, and where the light of truth shines only those with a stake in perpetuating cultural myths have reason to fear.

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The Author

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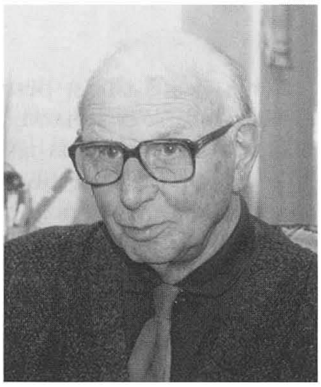
The Ambitions, Beliefs and Concepts of Charles Darwin : 2



Leonard Loose

Charles, Emma, Clowes and God

IN 1839 Darwin was greatly honoured by being made a member of the Royal Society. In the same year he married Emma Wedgwood. Miss Wedgwood was a member of the family famous for its porcelain. They were a distinguished family, a family of outstanding ability in their industry and craft. Emma was God-fearing, and she retained her God-fearing stance until she died.

Darwin knew this. It created a serious problem for him. He asked advice of his father. Ought he (Charles) frankly to inform Emma of his decided unbelief before they were married? His father advised him to keep the matter secret. This advice was given on somewhat altruistic grounds. From his care of the sick, Dr. Darwin knew that a godly wife has the pain of worrying about the eternal destiny of her avowedly unbelieving husband. The father wanted to spare his son Charles and Emma such distress. However, Charles did marry Emma. Charles drifted more deeply into unbelief. Emma continued in her regular attendance at church, in taking the Sacrament, in prayer in times of trouble. She saw to it that the children were taught the Bible.

Emma was related to William Clowes. The mother of William, Ann Wedgwood, was a sister of the great potter Josiah Wedgwood. Emma Wedgwood, wife of Charles Darwin, was the granddaughter of Josiah. William as a youth was apprenticed to his uncle Josiah. At the age of 25 William was soundly converted to Christ. At once he became an evangelist. By bold personal witness and enthusiastic preaching throughout the Midlands and the North he brought thousands of people to receive the Risen Christ as their Lord and Saviour and so built up the new church, the Primitive Methodists. The fervour of William Clowes and the close relationship between the Wedgwood and the Darwin families gave frequent opportunities for the evangelist to urge young Charles to acknowledge Jesus Christ as his Saviour. Was it at that time that the Darwin family inclined to consider a career for Charles in the Church?

From time to time Emma ventured to remind her husband that unbelief may have undesirable consequences, and suggested that he should not close his mind to them. For example, while away from home, she wrote to him: 'May not the habit in scientific pursuits of believing nothing until it is proved influence your mind too much in other things which cannot be proved in the same way and which, if true, are likely to be above our comprehension'. And again: '... in giving up revelation there is a danger ... that ought to make you more ... fearful lest you should not have taken all the pains you could to judge truly'. But Charles had decided on personal grounds that he could not accept Christianity for, as he understood it, 'his father, brother and almost all his best friends' would be everlastingly punished. This doctrine Charles described as 'damnable'. He was caught on the horns of a dilemma. His deep feelings and respect for his wife required that he tolerated her strong belief in God and her devout practices. His deep feelings of affection and respect for his father, brother and friends required that he take account of their unbelief in God. Emma's beliefs, if accepted, would compel him to accept the doctrine of eternal punishment. For this he felt nothing but revulsion. A serious, irresolvable conflict weighed upon him.

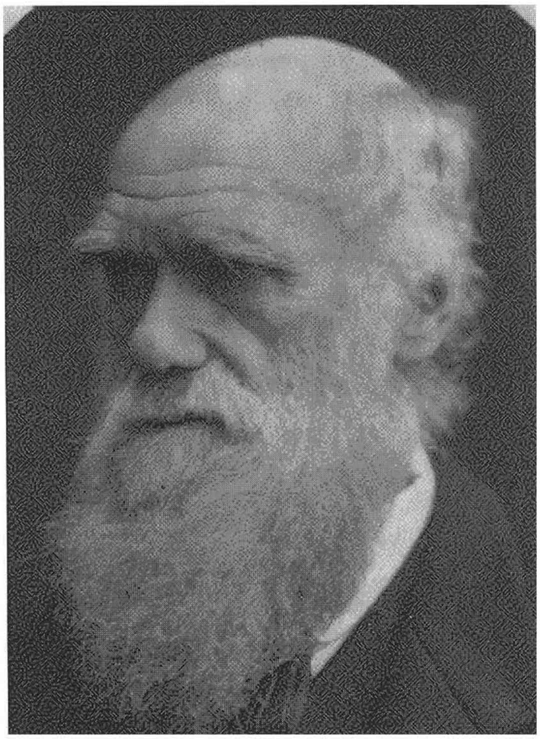
From this time and for many years, Darwin became subject to spells of debilitating ill-health. There is much uncertainty as to its cause. Several attempts have been made to account for his distressing complaint. Whatever the chief cause might have been, this profound difference in the attitudes of husband and wife to God, to the Bible and to the Church was not inconsequential. To their credit, Charles and Emma, with mutual respect, agreeably acknowledged their conflicting views. Nevertheless, as Dr. Robert Darwin had observed in his medical practice, such clashes of personal belief are damaging to human health.

Life or death, good and evil

From 1839 he had little or nothing to do with religion. He took up a position that he would answer no criticism except that which came from scientists. Why? Because in his opinion, religious views were of no value whatsoever. They were all based on false premises, so why give any time to them? A German student wrote to Darwin late in life and suggested to him that it is perfectly reasonable to combine his theory of evolution with belief in God. Darwin replied emphatically that there is no place for Christ in science.

Therefore his theory is wholly pervasive of unbelief. It is wholly persuasive toward discarding dependence upon God, and the recognition of God. It disregards the power of prayer. At best it restricts man to depending entirely upon himself. At worst it depicts him as a natural robot, a product of impersonal forces. God is rigorously excluded from His creation.

When Jesus Christ personally presenced Himself on earth and took command of man and nature, the leaders of Israel were quoted as having said: 'This is the heir. Come let us kill him, and the inheritance will be ours'. This action is parallelled in principle by the Darwinian assertion 'Science has nothing to do with Christ ...'. Having put Christ out, everything remains to be taken into human possession. The prize is big. The prospect is alluring. If it can be shown to you how nature works; if it can be told to you how a microscopic organism became a tiny fish; if it can be explained to you how the fish became a frog-like creature; if the stage by which the amphibian became a simple mammal can be traced before you; if the way the monkey's ancestor became a man is made plain for all to see; then we are prepared to give credence to the claim that the mastery of nature is within our grasp. Darwin, in his *Origin of Species*, gave a comprehensive explanation of the workings of nature. This comprehensive atheistic explanation in due course inspired the scientific quest for the manipulation of nature. Having explained how things came to be, it is but an exciting step forward to make use of the new insights so that man himself may direct future events in the natural kingdom. He would manipulate the constitution of living things to produce the kinds of plants, animals, and men he wanted them to be. Science now has its sights on far-reaching creative objectives. Man, we are given to understand, has the know-how to make the good better and to rid the natural world of much that is inimical to his own well being and that cuts short his personal pleasures.



Such was the inherent implication of the theory of evolution. Darwin gave explanation. Explanation brought new insights. Insight opened a way to manipulate. Manipulation in turn secured creative control.

Charles, evolution and the Book of Genesis

The course of the religious life of Charles Darwin had for a while brought him, as one reared in unbelief, into close personal involvement with God, the Bible, the church and with the natural kingdom. For four years at Cambridge, God and the Bible were presented to him chiefly in academic terms. The study of nature was pleasantly recreational. For five years on H.M.S. *Beagle*, the religious aspect was to be measured mainly in terms of its captain and of one of its officers. On the other hand, he now approached the study of nature as a professional naturalist. Darwin could not make sense of the biblical account of Creation and of the contemporary world. He spent some time looking into the Genesis account of the Garden of Eden. He did not like what he saw. Nature as biblically portrayed appeared to be quite inconsistent with the nature he knew. To his way of thinking, one or other of the two views of nature symbolised by the two trees—the tree of life and the tree of the knowledge of good and evil—must be false. To make sense of it, 'the tree of life must go'. The Creator and Keeper of the Garden must be excluded from the data base out of which human thought frames the theory of the significance of the history of the world past and present.

Freed from these encumbrances, relieved of restrictions imposed by this religious legacy of the understandably, but unnecessarily, complicating concepts of dim-witted primitive man, Darwin was at liberty to draw up a realistic explanation of the hitherto puzzling history of life on earth. It would be an explanation based on fact, fact as identified and approved by human reason and senses alone. In effect it means that the observations of the Darwinian senses processed by the Darwinian mind have given us the Darwinian theory of evolution.

So, having spent considerable effort and time in felling the massive and the true tree of life with its some six thousand years of growth, and in clearing its dismembered parts from the spacious domain of his own imagination, eagerly and hungrily Darwin moved on to the nearby tree of the knowledge of good and evil. He was soon feasting on the abundance of its fruits, for which, confessedly, he had an insatiable appetite. His admiration of the beauty of the natural kingdom knew no bounds. He found great and lasting satisfaction in the contemplation of its unlimited supply of food for thought. Pleasure and delight were often rising within him from the wisdom generated and sustained by its fruit. He esteemed it excellent beyond all other fruits available to him. So rich, so tasty, so satisfying, so inculcative of knowledge and understanding did it become to him that his devotion to this informative source, this fruit of the tree of the knowledge of good and evil, was complete! How well the tree grew! Receiving at his hand unbroken skilful care and attention, the tree so flourished that all other trees were overshadowed by its height and spread. Deprived of light, these other trees grew irregularly. Becoming misshapen they lost their attractiveness. This one tree towered over them all. Darwin was immensely pleased with his success. So pleased indeed that he renamed it 'The great Tree of Life'. The illusion was complete. The self-deception was irreversible. Evil and death were construed as good and life. Beetles and barnacles, fossils and finches, monkeys and men, savages and scholars, this vast range of living things past and present, though ravaged by disease, disorder, death and destruction were, in his view, ever rising into new and more beautiful forms. Natural selection had done it all!

The first break in the personal relationship between God and man, the Bible tells us, was on the issue of good and evil. Man was persuaded to accept the advice given to him that he would be markedly improved by including within his experience the fruit of knowing good and evil. In so doing he committed himself to the consequences of evil. The consequences were immediate and alarming. He found himself at once alienated from God his Creator, instinctively hostile to the truth, disturbed within himself by fear, a sense of guilt, and shame. He became vulnerable to death. His kingdom, the realm of nature, suffered with him, being bound by 'the shackles of mortality' and held in 'the thraldom of decay'. Darwin was the first scientist to combine together the consequences of good and evil so as to contrive a creative and unifying process in nature. Out of this interacting mixture of good and evil, out of this hybridising of life and death had come all the marvels of natural development and the immense diversity of species. Mud has become man! Darwin had reversed the natural process. Dust you are, to dust you will return; 'but not before a superspecies has appeared' could now be added! He incorporated evil in terms of competition, fighting, suffering and slaughter as the great feature of his evolutionary mechanism. Death was upgraded to be the natural process by which to rid the earth of the surplus of imperfect organisms to make room for the better. Darwin even went so far as to write 'At some future period, not very distant as measured by centuries, the civilized races of man will almost certainly exterminate and replace the savage races throughout the world ... at the same time ... anthropomorphous apes will be exterminated'. In modern terms, this Darwinian concept is as anti-conservationist as it is anti-Christian. So rejecting the revelation God has given of Himself, of His purpose for mankind and for the world, Darwin produces his own account of the origin of man and of all extant forms of life. He chose to base his theory entirely on the global consequences of the sin of man against God and on the inevitable chaos and disorder of a nature and a world run wild. Man, having flouted the authority of God, found himself in a hostile environment, with an outlook at enmity with God and a mind that refuses to yield to God. Professor Sedgwick who had known Darwin for many years, on reading the Origin of Species in 1859 said that Darwin had written it 'merely to make us independent of a Creator'. (*Darwin Before and After*, Robert E. D. Clarke. Paternoster Press, London, 1950, p.96)

T. H. Huxley and the 'logical absurdity'

This Darwinian philosophy stands out as the antithesis of the good news of Jesus Christ. Jesus Christ proclaimed deliverance to the captives. He opened the eyes of the blind. He set men free from the power of evil, and much more. Christ died for the weak. He gave himself to save those inferior to him in every way. He, the just, died for the unjust. He, the man of love, laid down his life for those who hated him. In His resurrection from the dead Jesus displayed the immense power of God available for the redemption and the renewal of the man who obeys Him. The origin and the basis of the good news of Jesus Christ is the very opposite of the origin and basis of evolution. God lifts men now, and in due time all creation also, out of evil. He transforms savages into saints, as Darwin late in life came to admit. They are a new creation, the expression of a life that is eternal. Jesus Christ said: 'I give them eternal life and they will never perish'. One of the men who were made infamous at Thessalonica for 'having turned the world upside down' wrote: 'If any man be in Christ he is a new creation. Old things are passed away, behold all things are become new. And all things are of God ...' (2 Corinthians 5:17-18). Such persons are beyond the reach of natural selection. They are selected and preserved by the power of their creator God.

Darwin himself recognised that his theory was very different from the good news of Jesus Christ. Rather lightheartedly in a letter to his great friend T. H. Huxley, he called it 'the devil's gospel'. Huxley in his turn, many years later (1893), commenting on his Romanes lecture in Oxford wrote in a letter to Sir M. Foster: 'Nobody sees that the lecture is a very orthodox production on the text (if there is such a one) 'Satan, the Prince of this world''. Ten days later Huxley, in writing to Lord Farrer, commented further on his Oxford lecture in the words: 'My lecture is really an effort to put the Christian doctrine that Satan is the Prince of this world upon a scientific foundation. Just consider it in this light, and you will understand why I was so warmly welcomed in Oxford'. Many a true word is spoken in jest. But T. H. Huxley was not joking. He was seriously concerned about the issues of right and wrong, of good and evil.

After the death of Charles Darwin in 1882 and in the intervening years to his own death in 1895, T. H. Huxley became increasingly concerned about the ethics of evolution. He took it upon himself to give serious warning to the public to beware of the morality of evolution. The warning was given in such impressive phrases as '... cosmic nature is no school of virtue, but the headquarters of the enemy of ethical nature ... the cosmos works through the lower nature of man, not for righteousness but against it'. 'Let us understand once for all that the ethical progress of society depends not on imitating the cosmic process but in combating it!'

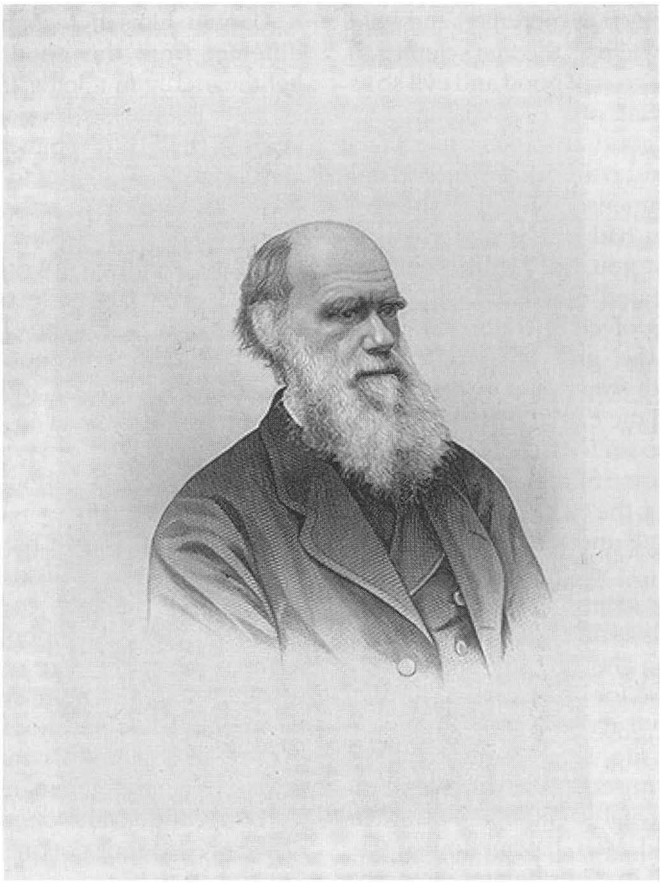
Having relished the deliverance from the bondage of Christian dogma into the freedom of science, Huxley found himself entrapped in the moral evil of the Darwinian philosophy he had espoused. The enemy was still there but in another guise. The acclaimed freedom was a delusion. Man must now fight against the very forces of nature that he reasoned had created him; and fight alone! This does not make sense. As T. H. Huxley acknowledged '... if the conclusion that the two are antagonistic is logically absurd, I am sorry for logic, because as we have seen, the fact is so'. Good and evil remain.

Man is in the grip of evil. Darwin in cutting down the wrong tree, committed two evils. He cut himself off from life on the one hand, and on the other, reduced his sources of knowledge to one dominated by evil, that is the kingdom of nature.

Yet another 'tree' was set up on the earth. To that 'tree' was nailed the only good man, the man free from all evil. He was put there by evil men. They did not know nor understand God's purpose in creation nor how it was to be worked out in the course of time. 'None of the rulers of this age understood it, for if they had, they would not have crucified the Lord of glory'. As one of the closest followers of this Lord of glory said to his murderers: 'You killed the Prince of life, whom God has raised from the dead; whereof we are witnesses' (Acts 3:15). 'You asked that a murderer be released to you'. But 'Our Saviour Jesus Christ abolished death and brought life and immortality to light through the gospel' (2 Timothy 1:10).

In the first century AD 'the princes of this world' passed their judgement upon the Son of Man, Jesus Christ. He must be cruelly destroyed as a common criminal. His presence among and His super-powerful impact upon the human race must be terminated. As a gesture of disdain a murderer was preferred to him.

If the religious leaders of Israel, the representative of Caesar, the mighty emperor of the great dominion of Rome, and the Greek philosophers were so foolish as to dismiss as false the incontrovertible factual evidence of the ability of Jesus Christ to save the world from the powers of disease, demons, evil and death, it is not surprising that men of outstanding intellect such as Darwin should discredit the work of God in creation and assign to an agency of chance and destructive competition the origin of the natural kingdom, rather than acknowledge the splendour of the creative skill, wisdom and authority of the same Jesus Christ.



'Therefore choose life'

Let us by all means do our best to understand the views of Charles Darwin. But how can we consent to be taught by him when we realise that we will be embracing the thoughts created by one who has taken four big decisions. He has decided:—

1. That there is no validity in Christian experience. He wrote 'I cannot see that such inward convictions and feelings are of any weight as evidence of what really exists'. To Darwin only matter matters.
2. Nor, according to Darwin, must we think that the Bible with its rich records of many historical facts can furnish us with evidence that may be sustained in our examination of the validity of his theory. He summarily dismissed the Bible as manifestly false history, untrustworthy and incredible.
3. Nor may we hope for its reinstatement if perchance some sense were to be found in it. Its authors, he said, were 'ignorant and credulous to a degree almost incomprehensible to us'.
4. Never mind, we may think, the impact on, and input to, the history of mankind by the living Christ is irrefutable! Maybe! Darwin would have none of it. Late in life (1879) in reply to the German student who had written to inform him that the theory of evolution is quite compatible with the belief in God, Darwin wrote: 'Science has nothing to do with Christ ... I do not believe that there has been any revelation'.

This influence of evolutionary teaching and the consequences of this misinterpretation of the outcome of good and evil, have worked right through every sphere of human activity, through its science, through its education, through its theology, through its philosophy, through its social life. The Lord Jesus Christ stands for that good, acceptable and perfect will of God. He said 'And I know that his commandment is life everlasting'. He not only said so, but by His death and resurrection has given historical demonstration of the fact and has proclaimed *Life* to the world. He stands against all wrong. 'He loved righteousness and hated iniquity'. As followers of the Lord Jesus Christ we unyieldingly oppose the Darwinian theory of evolution. For as the malignant cancer consumes the body from whose control it has escaped, so this evil infected theory, more than all other human theories, invades, devours, and finally threatens the extinction of the human race as we know it today.

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Appendices to this article are available on-line at http://website.lineone.net/~creation/

The Author

Leonard Loose graduated with first class honours in Botany from Leeds University in 1932 and was awarded a PhD in Plant Physiology in 1935. The results of his studies were published in the *Proceedings of the Royal Society* in 1936. There followed two years at the Missionary Training Colony, Upper Norwood, London, before Bible teaching in South India. Returning to England, an urgent call to meet a staff shortage at sixth form level in 1948 took him into grammar school teaching, in due course becoming Head of the Departments of Religious Education and of Science. Since retirement in 1973 he has given much attention to the works of Charles Darwin, developments in genetics, and geology.

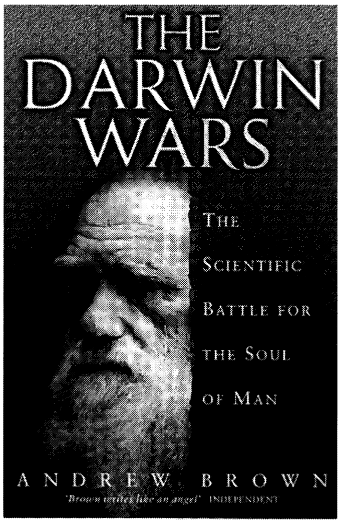
Reviews

The Darwin Wars: How Stupid Genes Became Selfish Gods, by Andrew Brown. Simon & Schuster UK Ltd. 1999.

Reviewed by David Tyler

THE subject matter of Andrew Brown's book is the acrimonious debate between leading defenders of the orthodox version of Darwinism, known as the neo-Darwinian synthesis, and the leading advocates for a new evolutionary synthesis. In many ways, Brown is well equipped for the task of reporting and evaluating. He is an experienced journalist with a long-standing interest in science and faith issues. However, he also brings his personal atheistic world view and, as we shall see, this has a significant influence on the way he handles different aspects of the controversy.

At the outset of the book, Brown says: 'When God died, he left many situations vacant' (p.ix). The starting point is that many of life's questions that were traditionally handled by religion are now being addressed by scientists. This is because science now has the prestige in popular culture that theology once had. Darwinism is of crucial importance, says Brown, 'and the study of our evolution can help us discover how we ought to live' (p.x). The problem is that different traditions of Darwinism come up with different, sometimes radically opposed, answers! The Darwin Warriors, therefore, are not engaged in purely scientific disputes. The protagonists have sought to show how their 'science' is pregnant with implications for human values, our sense of identity and our perception of meaning. The subtitle of the paperback version of Brown's book, 'the scientific battle for the soul of man', captures the message better than the phrase used in the first printing.



That neo-Darwinism has implications for our self-image is vividly demonstrated by the suicide of George Price, a colleague of William Hamilton (one of the architects of the neo-Darwinian synthesis). Price provided a mathematical analysis of altruism that plunged him into depression and eventually drove him mad. 'For though his equation showed that truly self-sacrificing behaviour can exist among animals, and even humans, it also seemed to show that there is nothing noble in it' (p.2). Not only are our lives characterised by self interest, our ideals are fundamentally selfish too.

The protagonists in the Darwin Wars have addressed these human issues extensively. There are debates over the adequacy of neo-Darwinian theory to account for the origins of biological complexity, but the issues are far deeper than this. 'The Darwin Wars...are about the scope and proper limits of Darwinian explanations' (p.18). This means that the controversies over sociobiology, a discipline now evolved into evolutionary psychology, are discussed in many chapters of Brown's book.

The human face of science is well brought out in the book. Brown has perceptive things to say about all the leading figures. Only a flavour can be given here. Of Richard Dawkins, he writes: 'when he was born in Nairobi in 1941 the fairies gathered round his cradle. The good fairy gave him good looks, intelligence, charm and a chair at Oxford specially endowed for him. The bad fairy studied him a while, and said: "Give him a gift for metaphor"' (p.25). This of course, has reference to the 'blind watchmaker', the 'selfish gene' and numerous other rhetorical phrases. Brown's comment: 'It's always hard to tell, when words, in his hands, mean more or less what he wants them to' (p.43).

Richard Dawkins is regarded by Brown as the most visible proponent of one of the parties in the Darwin Wars and Stephen Jay Gould is nominated as the equivalent leader of the other. 'Yet the astonishing thing about Gould as a show-off is that he gets his facts right; and he combines this accuracy with a voracious sympathy for his subjects...He has as an essayist a happy, Mozartian knack of making you think without realising you've done so. That is one reason for colleagues to loathe him. Another is his controversial skill. His sympathies are extended to opponents only after their deaths. While they are alive, he can make them wish him dead, as so many of them appear to do' (p.61).

Whilst I have always thought that the most fundamental divide between these parties relates to the adequacy of the neo-Darwinian synthesis to integrate biological data, Brown has a tendency to view these as differences of emphasis rather than substance. Consequently, in my opinion, these issues do not receive the attention they deserve. Instead, in this book, the great divide is over human behaviour and how it should be handled within the Darwinian paradigm.

Brown captures the debates over sociobiology and memes in a way that both sides would probably be happy with. He also adds his own views on the exchanges, and there is no reason to find fault with this apparent intrusion. A reporter is at least entitled to as serious a hearing as scientists talking outside their particular specialisms. For the same reason, this reviewer does not feel inhibited about pointing out some areas of omission that, in my judgement, reveal deeper issues than are addressed in either Brown's book or in the varied contributions of the Darwin Warriors.

There is an urgent need for the 'base data' in these debates to be more critically scrutinised. How far have scientists and other workers brought their presuppositions to the interpetation of their field data? This point is by no means new: philosophers of science have long debated the issue of objectivity in science and whether it is genuinely possible for scientists to abstract themselves from their domain of research and to present an impartial, value-free analysis of their findings. The problem in the Darwin Wars is that nearly all of the protagonists appear to consider that science is an autonomous route to truth. The Dawkinsian camp regards science as having an exclusive right to be called 'truth', whereas the Gouldian camp holds to the so-called NOMA thesis (in which scientific and religious truths are deemed to occupy distinct non-overlapping domains).

The Christian mind involves building a foundation of truth on God's revelation. There are no non-overlapping domains and there is no source of autonomous knowledge outside of God's revelation of truth in Christ and in the Scriptures. Science is inevitably a human activity, characterised by the frailty, fallibility and sinful character of humans. Science is the study of God's providential government of his creation, and as such, there can be no warfare between Christianity and science. On the contrary, the Christian engaged in scientific work finds research to be a form of worship.

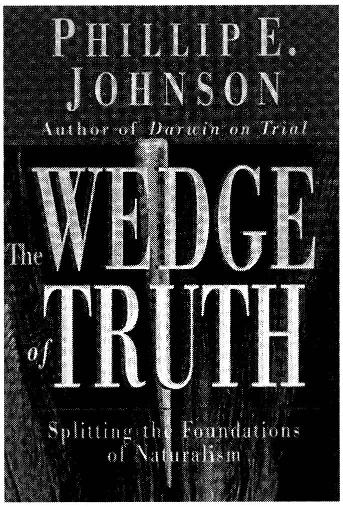
How can this be relevant to the Darwin Wars? The controversy surrounding the Yanomamö tribe is an interesting case study. The warring characteristics of this South American tribe were brought to the attention of a wide community of people by Napoleon Chagnon. He studied these people extensively and made several films of them in action. By and large, Brown provides a sympathetic portrayal of Chagnon's work—without probing the philosophical stance undergirding his research. At the time of writing this review, there is growing awareness of an anthropological scandal involving Chagnon and his co-workers. The charge is that Chagnon has viewed his subjects through the equivalent of coloured glasses, so that everything he observed and reported confirmed his expectations. This review is not the place to elaborate on the details—this is a topic worthy of fuller discussion when the topic has been given a fuller airing. The point being made here is that scientists are not impartial observers of the world, nor can they abstract themselves from cultural and philosophical influences. In different ways, we are all children of our times.

The application of this is that not only the evolutionary psychologists, but the whole field of evolutionary biology is affected by these human characteristics of science. The fundamental differences between the Dawkinsians and the Gouldians are philosophical. The debates about biology are like the tip of the iceberg—making the differences visible but concealing fundamental issues that do not generally occupy our attention. Brown's atheism conceals much from him—because, as an atheist, he can admit no other perspective than that adopted by the Darwin Warriors (nearly all of whom have advocated atheism). Brown thinks that the theistic perspective is irrelevant and a non-issue. That is the biggest mistake of the book and it significantly reduces its usefulness. The reality is that theistic science provides a radical and challenging alternative to the positions held by the Darwin Warriors. When atheists acknowledge that theists have satisfying and robust contributions to make on these issues, the debates really will get interesting!

The Wedge of Truth, by Phillip E. Johnson. InterVarsity Press, Downers Grove. 2000.

Reviewed by David Tyler

WHY is it that so many young people go into Higher Education and emerge as agnostics or atheists? Is it really a case of exposure to truth—an experience that sweeps away the 'childish mentality' associated with a religious upbringing? Many seem to view it like this and consider that scholarship can liberate people to escape, as they put it, from the superstition and ignorance on which religion thrives.

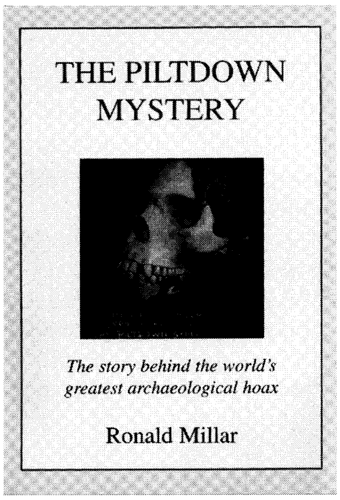

PHILLIP E.
JOHNSON
Author of Darwin on Trial
The WEDGE of TRUTH
Splitting the Foundations of Naturalism

Phillip Johnson begins his challenging book with the story of Philip Wentworth, who went to Harvard University in 1924 to prepare himself for the Christian ministry and ended up rejecting the faith that had nurtured him. Johnson shows that instead of examining the issues in a scholarly way, Wentworth welcomed the critical environment that enabled him to justify his desire to become a sceptic. Far from his educational experience helping him towards maturity of thought, it undermined his ability to make a sound judgment. According to Johnson, Harvard did not help him to ask the right questions, nor to find rigorous ways of answering those questions.

Johnson then takes up the theme of 'asking the right questions' and visits numerous topics demonstrating that the problem is widespread among intellectuals. The first example comes from evolutionary biology. Advocates of origins via incremental transformation point to 'change' as proof of the theory. The real issue, however, concerns the origin of biological information. Where does it come from? Do evidences of 'change' (as presented in the textbooks, for example) cast light on increases in information and the origins of complexity? An incident in the life of Richard Dawkins reveals him protesting against the right questions being asked. In a recent book, Paul Davies correctly puts his finger on the information challenge necessary to address when thinking about 'the origin of life', but then he pulls back from the revolutionary implications of his own logic. Davies started well in asking the right questions, but stumbled when he came to answering them.

Surveys of the religious views of scientists reveal that many scientists do not consider science neutral about religious matters. Some others will say that religion occupies a distinct and separate domain from science, but this position leaves room only for deism and existentialism (definitely not biblical Christianity). The key question here is: 'Does theology provide any objective knowledge?' If the answer is 'Yes' (and all biblical Christians agree that God has revealed truth and that there is a source of authority outside of science), then there is a tension between the basic tenets of Christianity and the widely held view of what constitutes science. Johnson's chapter on this subject provides an important challenge for Christians to engage with contemporary culture. 'If theologians are unwilling or unable to challenge the materialist definition of 'knowledge' implicit in evolutionary science, then they deserve no more cognitive status than Gould or Dawkins are willing to give them' (p.103).

In his chapter on 'Darwinism of the mind', Johnson examines the views of some intellectual gatekeepers in the sciences of humanity: cognitive psychology and the neurosciences. Dawkins' views on selfish genes and ourselves as robot survival machines are discussed. But when Dawkins advocates a robot rebellion, for us to 'upset' the designs of our selfish genes, Johnson concludes that 'this is both scientifically absurd and morally naïve' (p. 107). This leads on to a discussion of memes, of the way Steven Pinker has attempted to handle infanticide using evolutionary psychology, and several other current issues. The key question in this area is 'Is the thinking, choosing self an illusion?' The dominant response in the intellectual world is to answer 'Yes'. Johnson concludes by throwing down the gauntlet: 'It is time for an effective challenge to this constricting, authoritarian, self-contradictory ideology' (p.124).



THE PILTDOWN MYSTERY

The story behind the world's greatest archaeological hoax

Ronald Millar

The world of scholarship has moved far from its roots. Most Christians appear to be unaware of the mindset of today's intellectual leaders. According to Johnson, academia has moved beyond atheism. It is not even important to people that they debate the existence of God. This is because knowledge is defined in naturalistic terms. Consequently, if God exists, he must be subject to the laws of nature and must be accessible to man's intellectual probing. It is into this marketplace of ideas that Christians must enter and find ways of contributing confidently.

Clearly, Christians need to be involved in the debate about what science is. Progress within the discipline of science will make it much easier to address related issues facing scholars in the humanities. These debates are important for the intellectual health of these different disciplines, because the present culture is increasingly resistant to rational debate and more conducive to power struggles. This degeneration is widespread. Reason gets us from premises to conclusions but it does not tell us what premises to rely on. Modernists try to derive ultimate premises by reasoning from other premises and they end up with circular arguments. The Christian has a better way. Reason needs to build on a solid foundation of truth, and this is exactly what God has given us by revealing Himself in Jesus Christ and in the Scriptures. Our starting point has been given us by Solomon: 'The fear of the Lord is the beginning of wisdom' (Proverbs 1:7). In the latter chapters, Johnson presents his thoughts on what this revealed foundation looks like.

This is an excellent book. Anyone involved with the world of scholarship, including students, will find benefit in thinking through the varied issues presented. Johnson has his finger on the pulse of the debates he describes, and always has a refreshing and interesting perspective to contribute.

The Piltdown Mystery: The Story Behind the World's Greatest Archaeological Hoax, by Ronald Millar. S.B. Publications, c/o 19 Grove Road, Seaford, East Sussex, BN25 1TP. 1998. 79 pp. ISBN 1–85770–159–3. £6.50.

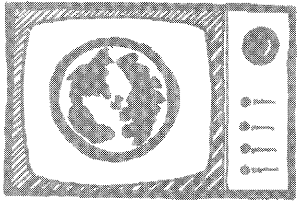
Reviewed by Pete J. Williams

THIS book is not to be confused with the author's previous book *The Piltdown Men: A Case of Archaeological Fraud* (Paladin, St. Albans, 1974), which was substantially a defence of Charles Dawson from involvement in the Piltdown hoax. Rather here the author seeks to give a historical survey of the whole Piltdown mystery from the discovery in 1912 of the human cranium and orang-utan jaw, which together for decades held pride of place as the best example of a missing link, to the eventual discovery of the true nature of the finds in 1953. The narrative is that of a journalist and in this way the author vividly portrays an era in which the British were desperately looking for some fossil find to match continental triumphs in discovering missing links between humans and apes. The book shows how even at an early stage there were warning signs that the discovery at Piltdown was suspicious. There are some scientific heroes such as Gerrit Miller of the Smithsonian Institute in Washington, who denied that the cranium and jaw should ever have been connected, and various debates about archaeological interpretation are touched on. The final chapter is only a brief 'whodunit?', but Charles Dawson is again exonerated and the final word is left with Miss Kenward from Barkham Manor (the location of the gravel pit in which 'Piltdown Man' was discovered) seeing a suspicious figure slinking away one dusk. The description is said to be very much like the Jesuit priest Pierre Teilhard de Chardin. The author even suggests that Teilhard gives hints of his own personal unease at the hoax in his writings prior to 1953.

The book contains a good number of diagrams and black and white photos, which alone make the book worth its price. It also contains an inordinate number of typos, sometimes including the spelling of names.

The book is also available from the web page of the Sussex village of Piltdown's pub 'The Piltdown Man', formerly 'The Lamb', which received its new name in 1949 shortly before the hoax was discovered. Go to http://www.thepiltdownman.com/ and follow the links to the Gift Shop and then the Piltdown Man Book.

Creation in the News



Human Genome Project: 'proof' of Darwinism?

THE first draft of the human genome—the genetic blueprint for a human being—was published in February 2001 in two leading science journals. This momentous achievement attracted a great deal of media coverage, much of it focusing on the rivalry between the two teams of researchers. Some, however, hailed the project as 'proof' of evolution. Sir John Sulston of the U.K. team said, 'We are confirming Darwin, it's great to be getting the molecular correlates of what Darwin hypothesised 150 years ago'. One commentator proclaimed, 'The genome reveals, indisputably and beyond any serious doubt, that Darwin was right—mankind evolved over a long period of time from primitive animal ancestors'. In fact, creationists should take great encouragement from the unravelling of the 'book of life'—the almost unimaginable complexity of the human genome confounds Darwinian explanations. There is no known 'natural' process that can give rise to coded information, such as we find in the DNA of a human being.

Anti-creationism comes to Westminster

ON the 28th of February 2001, anti-creationist campaigner Ian Plimer addressed a meeting of the All-Party Earth Sciences Group at Westminster. His talk was provocatively entitled 'A Gospel of Deceit or Truth—is "creationism" a threat to the future of education, science and technology?' Plimer is Professor of Geology at the University of Melbourne and author of a notorious anti-creationist book, *Telling Lies For God* (Random House, 1994). The book is full of basic scientific and biblical errors, and replete with slurs, falsehoods, and *ad hominem* attacks on individual creationists. A point-by-point rebuttal of the book is available on the web (http://www.answersingenesis.org/docs/184.asp). Plimer first came to prominence after debating Dr. Duane Gish in 1988. The Institute for Creation Research later reported that Plimer's was 'by far the worst behaviour ever encountered by Dr. Gish'. His behaviour at that debate, and subsequently, was so reprehensible that even fellow anti-creationists have sought to distance themselves from him. Jim Lippard, for instance, published an article about Plimer's antics called 'How not to argue with creationists' in a humanist journal.

Rapid speciation in salmon

A STUDY published in *Science* has shown that salmon introduced to a US lake in 1937 split into two reproductively isolated populations in fewer than 13 generations (60–70 years). This confirms that animal species can arise in surprisingly short time scales, especially when new environments are being colonised. Such changes do not lend any credibility to 'molecules-to-man' evolution—the salmon are still salmon and no new genetic information has been added! To the contrary, this is good news for creationists, who have long argued that speciation within the Genesis kinds must have taken place rapidly after the Flood.

More debunked junk

SINCE we published Dr. Nancy Darrall's article in *Origins* 29, more evidence has come to light to show that so-called 'junk DNA' is far from junk. Nearly 97% of the human genome is said to be a useless left-over from our evolutionary past. However, a new study has found that mice and humans share 4% of this 'junk DNA', suggesting that it has a function after all. Andrew Feinberg of Johns Hopkins University (Baltimore) and colleagues made the discovery when they compared a million genetic letters on chromosome 11. The shared bits of 'junk DNA' are close to genes, and probably play a role in gene regulation.

Modern fungi in the Ordovician

NEWLY described fossil fungi from sediments supposedly 460 million years old are virtually identical to modern fungi of the *Glomales* type. The hyphæ and spores were found in a dolomite of the Guttenberg Formation (mid-Ordovician) of Wisconsin. This find extends the fossil record of fungi back by 55–60 million years on the conventional time scale. 'Living fossils' like these demonstrate the persistence of basic types predicted by creationist theory.

A fishy tale about 'The Missing Link'

A JAWBONE 're-discovered' in a dusty museum in Latvia has been formally described as a new species *(Livoniana multidentata)* in a palæontological journal. Media interest was stirred by the exciting claim that the jawbone had come from a transitional fossil, showing how all four-limbed animals (tetrapods) had evolved from a fish ancestor. In a recent documentary, BBC2 proclaimed the fossil to be 'The Missing Link', a creature that was half-fish and half-tetrapod. This is an extraordinary assertion in view of the extremely fragmentary nature of this fossil. It is a five-centimetre-long fragment of lower jaw. We know nothing about the rest of the animal at all; crucially, we have no idea whether it possessed fins or legs. In other cases where the fossil material is more complete, it is obvious whether the animal in question was a fish or a tetrapod. Furthermore, the jawbone has a unique characteristic—up to six rows of teeth—which is not seen in the 'ancestral' fish groups or the 'early' tetrapods. This makes it difficult to place *Livoniana* in an evolutionary position somewhere between the two.

The Mars rock revisited

CONTROVERSIAL claims about crystals in a Martian meteorite (ALH84001) have re-ignited the debate about whether life once existed on the Red Planet. A new study says that tiny magnetic grains found in the meteorite are identical to grains made by some types of bacteria on Earth. However, other scientists are not impressed with the claims. Professor John Bradley, of Georgia Technical School of Materials and Technology, said that although the crystals are consistent with those made by bacteria, they may not be unique to bacteria and therefore a non-organic origin cannot be ruled out. Professor Bradley called the study 'Custer's last stand' in the great Mars meteorite debate. You may remember the media frenzy in 1996 when it was announced that scientists had found fossil microbes in this meteorite. *The Times* carried the story on its front page, with comment from our own Dr. John Peet and Geoff Chapman of Creation Resources Trust.

Drilling for dinosaurs

GEOLOGISTS hope to solve some mysteries surrounding the extinction of the dinosaurs by drilling into the crater that has been linked to their demise. Most scientists think that the dinosaurs died out when an asteroid or comet collided with the Earth at the end of the Cretaceous period. The impact would have thrown vast amounts of dust into the atmosphere, blocking out sunlight and leading to an environmental disaster. The 'smoking gun' is a 200 km wide crater on Mexico's Yucatan Peninsula. However, recent computer and field studies suggest that the impact may not have been large enough to produce the mass extinction seen in the fossil record. Some scientists have argued that dust from the collision must have reacted with the Earth's atmosphere to create a deadly sulphuric acid and carbon dioxide mix. They hope that the drilling project will solve the puzzle by revealing new information about the rocks under the crater site and the likely effects of pulverising them and hurling them into the atmosphere. These developments will be of interest to creationists thinking about how meteorite impacts fit into a biblical view of Earth history.

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The price of a single issue is £3.00 plus postage. *Origins* 27 was a special issue with a price of £3.50 plus postage.

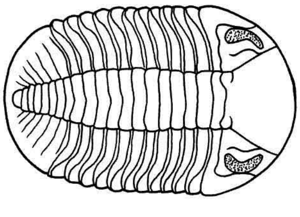
Credits & Acknowledgements

The editors thank Jack Lewis for the drawings on pages 6–7 and 9–13.

Back cover:

(Top and bottom) *Cruziana* trails in Palæozoic sediments of northern Spain (see page 11). Photographs courtesy of Michael Garton.

(Centre) An unidentified trilobite. Photograph courtesy of Dr. Marc Surtees.



ISSN 0953–2773

Designed and set by Langlands Edition

Printed by Inkon Printers, Oldham Street, Hyde, Cheshire SK14 1LL. Tel: 0161–368 3444

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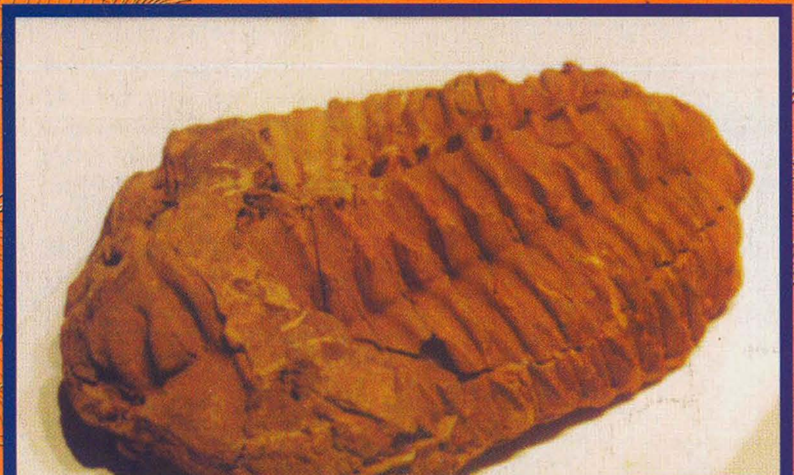

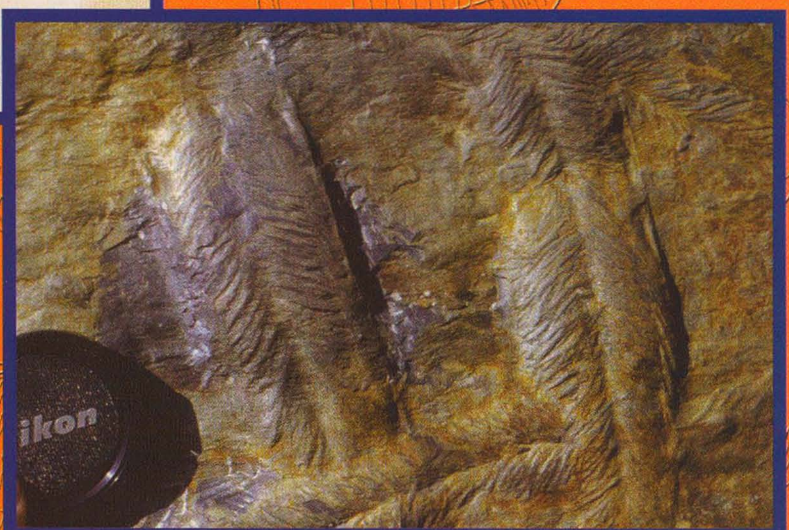

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